

**UK MET OFFICE
GLOBAL DATA MONITORING REPORT**

March 2004

ORGS UK MO

**Data Assimilation
Meteorological Office
Fitzroy Rd
Exeter
Devon
EX1 3PB**

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

Mr. D. Richardson
Observations Data Monitoring Group
Met Office
Fitzroy Road
Exeter
Devon
United Kingdom
EX1 3PB

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1 and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of $>60 \text{ m s}^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference $> 60 \text{ m s}^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure Parameter

- 4 Mean wind vectors
- 5 Mean observation - background wind vector
- 6 Mean observation-background speed (m s^{-1})
- 7 RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbiting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbiting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbiting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPS, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

**MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Mar 2004**

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees). :Air temperature (Degrees C). :Relative Humidity (%). :Sea surface temperature (Degrees).
Parameters monitored	:NOBS :Number of observations received excluding duplicates. :PGE :Percentage of observations with gross errors. :%REJ :Percentage of observations flagged excluding those with gross errors. :SD :SD of difference of observations from background values excluding those with gross errors. :BIAS :Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the wind observation is veered to the background. :RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa (pressure) :25 m s^{-1} (vector wind) :15 degrees (air temperature) :10 degrees (sea surface temperature)
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SELECTION CRITERIA	:NOBS ≥ 20 , and one or more of the following:
1. bias	≥ 4 hPa (pressure), $\geq 5 \text{ m s}^{-1}$ (wind speed), ≥ 30 degrees (direction). ≥ 3 degrees (sea surface temperature). ≥ 4 degrees (air temperature) $\geq 15\%$ (relative humidity)
2. SD	≥ 6 hPa (pressure), ≥ 80 degrees (direction). ≥ 5 degrees (sea surface temperature). ≥ 6 degrees (air temperature) $\geq 25\%$ (relative humidity)
3. PGE	≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8AM2	P	49	0	53	2.5	4.0	4.7
C6FV4	P	35	0	11	0.9	7.9	8.0
C6YW	P	24	4	96	1.3	5.9	6.0
DMRX	P	23	0	57	0.8	4.5	4.6
ELZN3	P	32	3	69	1.2	5.3	5.5
KMJL	P	28	0	32	1.1	-4.5	4.6
KS003	P	30	0	100	0.6	5.7	5.7
KS005	P	111	0	0	0.4	-4.1	4.1
KS006	P	228	0	0	0.4	4.6	4.6
OUQK2	P	21	0	76	3.3	5.0	6.0
SXVF	P	45	0	60	2.1	6.9	7.2
TEST	P	106	98	100	1.8	-10.2	10.4
UCJL	P	24	0	79	3.4	7.1	7.9
UCUO	P	54	31	76	4.3	-6.4	7.7
VOTV	P	23	0	83	4.4	-6.1	7.5
VRXO6	P	31	0	39	6.2	-4.1	7.4
VRYO2	P	27	0	52	1.9	4.4	4.8
VTXK	P	38	0	5	2.6	4.9	5.5
WCN4995	P	36	3	75	1.7	4.6	4.9
WCY7054	P	27	0	26	2.0	5.2	5.5
WDJK	P	52	0	25	1.1	-4.0	4.1
WMCV	P	60	0	77	2.2	-5.1	5.5
WSRH	P	38	0	21	1.2	-4.9	5.0
WYR4481	P	27	4	85	4.9	6.3	8.0
62166	P	66	0	100	5.6	4.9	7.4

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8AV9	SPEED	30	0	100	5.9	5.5	8.1
C6JS	SPEED	25	0	20	2.6	5.7	6.2
ELWU3	SPEED	24	0	25	3.5	6.7	7.6
H9YY	SPEED	66	0	11	3.2	5.2	6.1
OYVQ2	SPEED	25	4	100	6.3	5.0	8.1
PBVO	SPEED	37	0	100	3.2	-7.0	7.7
TSMU	SPEED	52	8	100	6.0	12.5	13.9
VRYS8	SPEED	36	0	72	3.6	6.1	7.1
3FRA8	SPEED	38	0	71	6.3	10.4	12.1

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDT	DIRN.	142	0	0	29.6	-30.5	42.5
DEJL	DIRN.	21	0	0	46.3	31.5	56.0
LOAI	DIRN.	24	4	0	40.7	34.7	53.5
VLTT	DIRN.	59	3	0	60.3	34.8	69.6

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDT	T	179	7	100	2.8	-11.1	11.4
KS034	T	173	8	100	7.9	-3.1	8.4
TEST	T	107	15	100	6.7	-0.2	6.7
UCEF	T	22	0	100	5.1	5.0	7.2
UCJS	T	21	0	100	3.1	-5.6	6.4
UGTP	T	40	0	100	2.4	-4.4	5.0
VRXO6	T	31	39	100	1.9	1.3	2.3
WCN4995	T	32	6	100	3.3	5.2	6.2
WCW9126	T	76	0	100	3.7	5.1	6.3
WWU8	T	25	0	100	2.4	5.8	6.3
46081	T	737	1	100	3.4	6.6	7.4
46181	T	729	0	100	2.1	4.9	5.3

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CR6	RH	28	0	100	9.8	16.0	18.8
CGSB	RH	212	0	100	14.0	-15.7	21.0
DICB	RH	30	0	100	16.2	-18.0	24.2
FILL	RH	59	0	100	22.4	-43.2	48.7

FNAT	RH	96	0	100	6.3	21.3	22.2
PJVQ	RH	90	0	100	7.1	-19.6	20.8
SCKM	RH	30	0	100	25.0	-1.7	25.1
ZSWAV1	RH	44	0	100	9.9	-27.1	28.8
3EZF5	RH	65	0	100	10.9	18.8	21.8
4XGS	RH	36	0	100	8.1	17.4	19.1
62125	RH	71	0	100	9.1	16.1	18.5
62402	RH	31	0	100	12.5	-16.1	20.4

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CC9	SST	72	10	64	2.8	3.5	4.5
A8CR8	SST	37	62	78	2.0	-3.0	3.6
CGDR	SST	63	25	105	4.3	7.5	8.6
C6FE5	SST	28	0	100	1.3	3.3	3.5
ELZT3	SST	427	86	102	0.5	0.0	0.5
GQVJ	SST	44	0	102	1.8	-3.6	4.0
HOJH	SST	46	0	41	1.2	-3.6	3.8
KGJD	SST	374	35	54	3.5	-0.5	3.5
KHRH	SST	29	0	100	1.3	-3.7	3.9
KS003	SST	30	0	100	0.1	-9.3	9.3
KS035	SST	45	0	100	3.2	4.3	5.3
LAJV4	SST	41	0	100	2.0	3.4	3.9
P3FX6	SST	44	0	9	0.6	3.4	3.4
TSMU	SST	76	0	25	0.8	-3.3	3.4
UCEF	SST	27	0	22	1.6	3.4	3.8
UFLC	SST	31	3	61	2.1	4.6	5.0
VOCJ	SST	213	50	85	2.2	4.7	5.2
V2OH1	SST	26	0	100	3.3	-3.0	4.5
V2WB	SST	23	0	109	1.5	-4.3	4.6
WCZ5528	SST	42	7	76	1.9	-3.7	4.2
WDCJ	SST	50	4	44	2.5	3.3	4.1
WFLH	SST	73	0	64	1.4	3.2	3.5
41008	SST	616	0	100	0.7	-3.3	3.4
41025	SST	716	1	97	4.2	-4.6	6.3
9VNA	SST	23	0	100	1.1	3.6	3.8

Figure 1. SHIP/SYNOP mean daily count. MARCH 2004
 All hours
 Global average number of observations in 24 hours = 21222

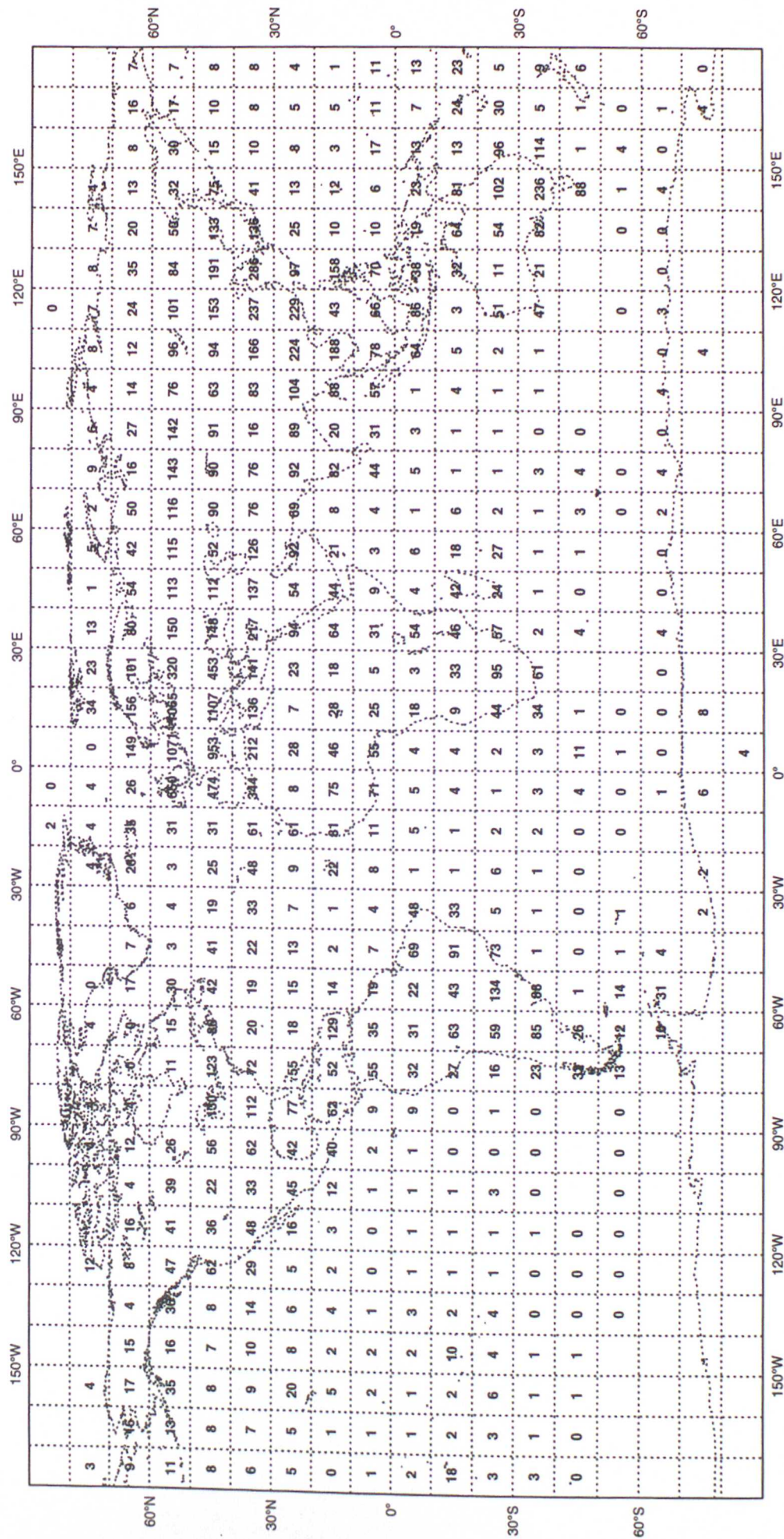


TABLE 2

**MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Mar 2004**

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ : Percentage of observations flagged excluding those with gross errors

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias| ≥ 4 hPa (pressure),
 $\geq 5 \text{ m s}^{-1}$ (wind speed),
 ≥ 30 degrees (direction).
 ≥ 3 degrees (sea surface temperature).

2.SD ≥ 6 hPa (pressure),
 ≥ 80 degrees (direction).
 ≥ 5 degrees (sea surface temperature).

3.PGE ≥ 25 .

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
21575	26.5	127.8	P	158	54	61	4.4	1.1	4.5
33593	-43.0	16.7	P	224	21	57	6.1	-0.8	6.2
64523	67.2	-19.7	P	176	26	82	7.1	-2.7	7.6
71614	-60.0	-56.0	P	59	100	100			

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
32693	7.3	-126.9	SST	572	0	100	0.1	3.0	3.0
33502	-34.1	-14.0	SST	111	0	100	0.6	4.9	4.9
33566	-24.1	90.8	SST	125	35	53	2.4	-1.9	3.1
46710	38.1	-142.3	SST	27	100	100			
46972	18.0	-175.5	SST	157	0	100	0.3	3.6	3.6
64523	67.4	-21.1	SST	570	0	100	1.4	4.4	4.6

Figure 2. DRIFTER mean daily count. MARCH 2004
 All hours
 Global average number of observations in 24 hours = 11275

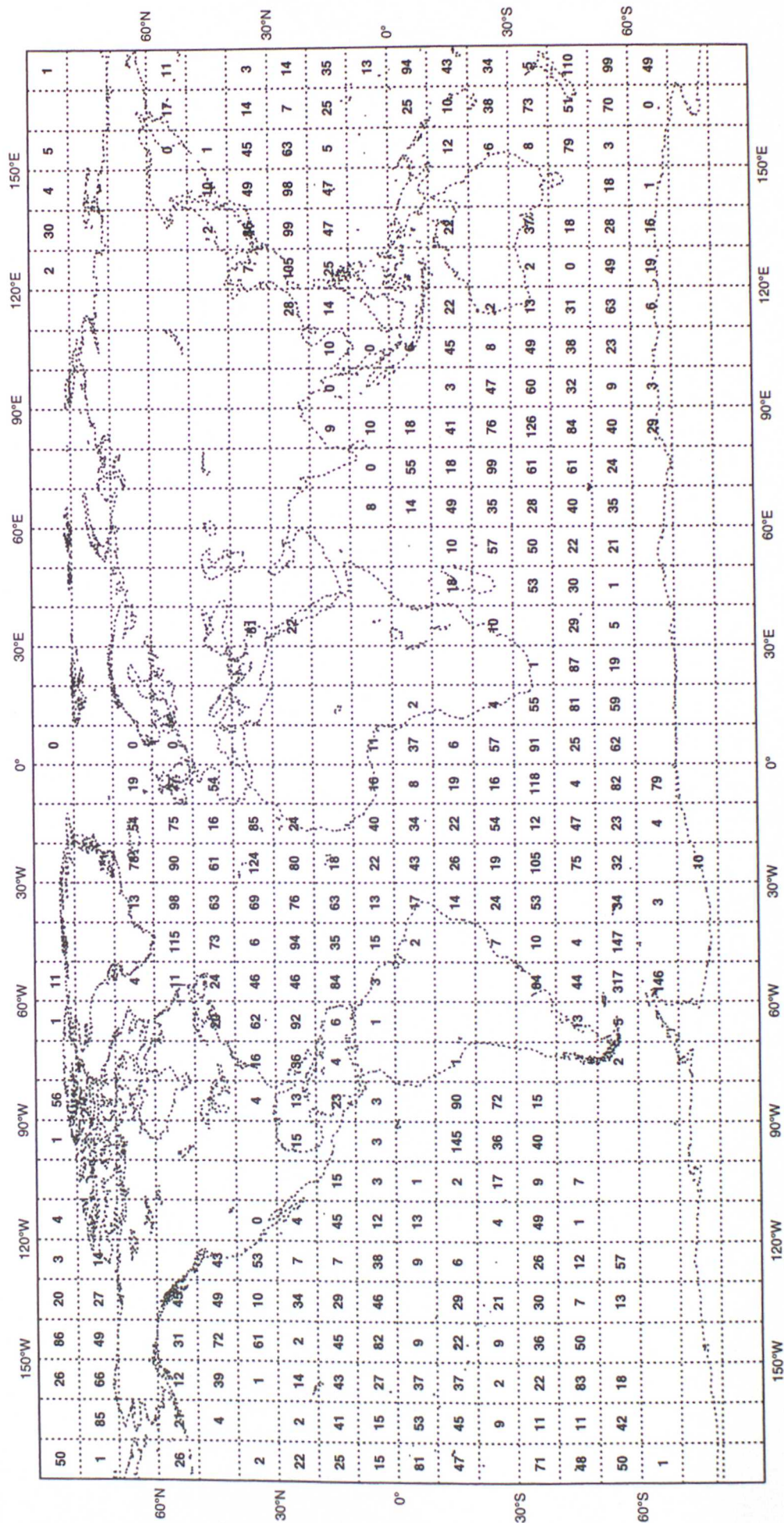


TABLE 3

**MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Mar 2004**

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1. bias	≥ 4 hPa
	2. SD	≥ 6 hPa
	3. PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION MAR 2004

WMO REGION 1:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	68	9	13	3	1.2	-9.7	9.8
60728	36.4N	10.7E	1	MS	69	1	1	1	0.8	-8.6	8.6
61492	16.1N	13.5W	18	MS	70	0	0	0	1.8	4.3	4.7
61816	10.9N	14.3W	69	MS	29	8	28	0	1.8	-1.4	2.3
62056	32.8N	21.8E	625	S8	68	1	1	4	1.9	-5.7	6.0
63330	13.5N	39.5E	2070	MS	27	27	100	100			
63333	11.1N	39.7E	1903	MS	28	0	0	29	0.6	5.0	5.0
63334	10.3N	37.7E	2515	MS	28	1	4	43	1.3	10.3	10.4
63450	9.0N	38.8E	2354	MS	22	0	0	5	0.7	4.3	4.4
63478	5.9N	43.6E	295	MS	28	0	0	11	1.7	4.9	5.2
63801	4.9S	29.6E	882	S8	72	0	0	0	0.9	8.1	8.1
63881	8.0S	31.6E	1923	S	49	5	10	0	1.9	12.9	13.0
65355	9.8N	1.1E	342	MS	118	0	0	0	1.2	-12.1	12.2
67229	14.7S	34.3E	1270	S8	52	48	92	96	5.4	10.9	12.2
68014	19.6S	18.1E	1411	S8	24	0	0	0	1.2	-6.0	6.1
68030	18.5S	25.6E	1071	8	78	0	0	0	4.1	5.8	7.1
68106	23.6S	15.1E	407	MS	48	2	4	46	3.6	-7.9	8.7
68300	26.6S	15.1E	16	MS	84	52	62	0	4.5	-13.0	13.8
68372	26.9S	29.2E	1563	S8	123	0	0	0	0.5	4.6	4.6
68396	26.5S	31.3E	641	S8	53	0	0	0	0.8	4.9	5.0
68575	30.0S	30.0E	1175	S8	123	123	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
25248	67.3N	168.0E	353	MS	40	0	0	0	2.7	6.2	6.8
30554	54.5N	113.6E	995	MS	123	0	0	0	1.1	11.1	11.2
35416	49.1N	54.7E	128	S	120	1	1	2	1.7	4.3	4.6
36982	41.9N	78.2E	3635	S7	102	0	0	0	1.1	6.7	6.8
38565	40.6N	65.7E	485	MS	122	121	99	0	0.0	-1.1	1.1
38846	38.4N	70.0E	1437	S8	49	3	6	4	1.8	-5.9	6.2
40435	24.5N	44.4E	991	MS	60	1	2	0	0.8	7.8	7.8
40700	39.6N	47.9E	45	MS	115	2	2	2	1.3	-5.5	5.7
40713	37.4N	46.3E	1475	MS	121	53	44	1	0.8	13.4	13.4
40726	36.8N	45.7E	1384	MS	118	1	1	0	1.0	4.0	4.1
40741	36.5N	61.2E	235	MS	122	1	1	2	1.4	-4.5	4.7
40743	36.2N	57.7E	978	MS	118	0	0	1	1.4	4.7	4.9
40757	35.6N	53.4E	1171	MS	118	0	0	14	1.2	4.4	4.6
40780	33.6N	46.4E	1362	MS	119	1	1	2	0.8	5.1	5.2
41254	23.1N	57.6E	1755	S8	100	100	100	0			
41396	16.0N	48.9E	700	MS	25	1	4	56	1.9	5.5	5.8
47022	40.8N	128.2E	1224	S	111	0	0	0	1.0	4.5	4.6
47678	33.1N	139.8E	79	MS	123	0	0	0	0.7	-9.4	9.4
48924	21.1N	101.5E	644	S	58	0	0	0	1.6	10.8	10.9
48925	20.7N	102.0E	550	S	56	0	0	0	1.3	-10.6	10.7
48938	19.2N	101.7E	326	MS	53	30	57	0	0.5	14.0	14.0
48952	15.7N	106.4E	168	MS	53	0	0	0	1.3	-4.0	4.2
50727	47.2N	119.9E	1028	MS	123	0	0	0	0.8	5.0	5.1
50978	45.3N	131.0E	234	MS	123	0	0	0	0.8	-5.7	5.8
52866	36.6N	101.8E	2262	S	123	0	0	0	1.3	-4.3	4.5
53646	38.2N	109.7E	1058	MS	123	0	0	0	0.7	-12.1	12.1
56287	30.0N	103.0E	629	M	123	0	0	2	2.0	4.3	4.7
56462	29.0N	101.5E	2994	S	123	0	0	0	1.6	8.9	9.0
56768	25.0N	101.5E	1773	S	123	0	0	0	1.0	-5.3	5.4
57816	26.6N	106.7E	1074	MS	123	101	82	0	0.4	-14.6	14.6
59663	21.9N	112.0E	22	MS	123	0	0	0	0.8	-7.6	7.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	99	5	5	4	2.2	-4.6	5.1
82181	2.0S	54.1W	146	MS	88	0	0	0	1.1	5.2	5.3
82704	7.6S	72.7W	170	S	84	0	0	0	1.2	-4.7	4.9
83235	12.4S	46.4W	604	MS	87	0	0	0	0.6	6.4	6.4
83332	14.1S	46.4W	826	MS	87	8	9	0	0.8	13.4	13.4
83470	17.9S	50.9W	727	MS	84	0	0	0	0.5	-5.6	5.6
83531	18.6S	46.5W	940	MS	89	0	0	1	0.7	-6.0	6.0
83738	22.5S	44.5W	440	MS	56	7	13	0	0.8	-13.5	13.5
83836	25.5S	50.6W	837	MS	89	0	0	2	1.3	-5.5	5.7
84425	5.9S	76.1W	179	MS	24	0	0	0	1.4	4.6	4.8
84455	6.5S	76.4W	281	MS	75	2	3	0	1.4	7.4	7.5
84472	7.1S	78.5W	2620	S	52	1	2	2	0.6	-5.2	5.2
84474	7.2S	76.7W	350	S	23	0	0	0	1.0	9.6	9.7
84686	13.6S	72.0W	3248	S	104	0	0	0	0.6	-4.1	4.1
84688	13.7S	73.4W	3444	S	45	1	2	0	0.7	-12.0	12.0
84720	14.9S	75.0W	567	M	49	1	2	0	0.6	4.1	4.1
84782	18.1S	70.3W	468	MS	81	1	1	1	1.4	7.1	7.2
85140	14.3S	67.4W	140	MS	59	0	0	0	1.1	6.6	6.7
85312	19.8S	63.9W	992	S	43	1	2	28	1.7	-12.5	12.6
85406	18.3S	70.3W	55	M	123	0	0	0	1.0	4.0	4.1
85432	22.5S	68.9W	2320	S8	85	0	0	0	0.6	4.9	4.9

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	123	0	0	3	2.0	6.2	6.5
71060	52.5N	116.1W	230	MS	123	123	100	0			
71094	66.0N	61.6W	393	MS	96	0	0	1	1.2	-6.0	6.1
71176	60.6N	64.2W	551	S	101	0	0	0	1.5	-4.0	4.3
71181	47.1N	55.3W	29	MS	118	0	0	0	0.9	-6.3	6.4
71421	51.9N	63.3W	589	MS	123	0	0	0	0.8	4.4	4.5
71499	63.2N	101.8W	237	MS	38	0	0	34	5.6	4.0	6.9
71506	67.0N	136.2W	720	MS	122	0	0	1	1.3	-5.3	5.5
71619	48.0N	65.3W	46	MS	369	232	63	0	3.6	-0.8	3.7
76055	31.0N	114.9W	440	MS	47	47	100	0			
76225	28.6N	106.1W	1435	MS	77	1	1	0	1.0	-4.5	4.6
76658	19.2N	103.7W	494	MS	20	0	0	0	0.7	5.2	5.2
76762	17.5N	99.5W	1265	MS	59	1	2	0	0.9	5.7	5.8
76903	14.9N	92.3W	118	MS	53	0	0	0	0.9	5.2	5.3
78588	17.2N	87.5W	-289	M	123	114	93	0	0.6	0.2	0.6
78655	14.0N	89.6W	725	S	22	0	0	55	0.8	10.3	10.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94130	14.8S	131.9E	120	MS	122	0	0	0	1.1	5.1	5.2
96505	3.7N	115.7E	-9999	8	35	35	100	0			
98851	6.1N	125.2E	14	S	104	15	14	99	1.8	-13.3	13.4

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	123	0	0	1	1.2	7.0	7.1
04416	72.6N	38.4W	3202	S	39	38	97	26	0.0	13.9	13.9
06605	47.1N	7.1E	1599	S8	122	0	0	0	1.2	-4.0	4.2
06685	47.0N	9.1E	515	MS	122	0	0	6	0.8	6.9	6.9
08912	42.9N	0.8W	1434	MS	90	90	100	0			
08922	42.8N	0.2W	1660	MS	83	83	100	0			
10850	48.8N	10.7E	457	MS	367	0	0	0	0.4	-5.6	5.6

11116	47.5N	10.8E	870	MS	60	0	0	0	0.6	4.7	4.7
13269	44.3N	19.9E	176	MS	122	0	0	0	0.8	8.0	8.0
14554	44.9N	18.4E	136	S	59	0	0	0	0.8	-13.4	13.4
16450	37.6N	14.3E	940	S8	106	0	0	18	1.3	-4.2	4.4
16470	36.8N	12.0E	191	MS	123	0	0	0	0.9	-4.0	4.1
16538	40.1N	9.3E	1022	S	38	2	5	5	1.2	9.2	9.3
17116	40.2N	29.1E	100	MS	121	36	30	0	1.3	0.1	1.3
17203	38.9N	40.5E	1177	S8	121	0	0	0	0.9	6.1	6.2
17310	36.6N	32.0E	6	MS	115	97	84	0	0.7	-0.6	0.9
37018	44.1N	39.0E	95	MS	120	0	0	0	0.7	6.4	6.4

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	95	0	0	0	1.2	-6.1	6.2
89257	75.4S	59.9W	40	S	787	0	0	0	1.7	-4.9	5.2
89263	66.0S	66.1W	20	M	254	12	5	0	1.2	12.3	12.4
89264	71.4S	68.9W	780	S	243	0	0	0	1.3	8.1	8.2
89266	72.2S	60.2W	91	S	265	213	80	0	8.5	-9.4	12.7
89272	75.0S	70.8W	1395	S	271	271	100	0			
89610	65.9S	113.1E	90	S	242	0	0	0	1.2	-8.2	8.3
89614	66.6S	111.2E	500	S	267	267	100	0			
89744	74.0S	43.1E	3353	S	282	0	0	0	0.8	7.1	7.1
89811	66.7S	112.8E	1366	S	260	0	0	0	1.1	-4.2	4.3

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
AAH	3642	0	41	1.7	-0.2		3623	0	41	0	6.8	0.6
AAL	6419	0	39	1.8	0.0		6129	0	40	0	7.3	0.1
AAR	1616	1	8	1.9	-0.4		1604	1	8	0	8.5	0.1
ACA	2500	1	11	1.6	-0.1		2183	0	12	0	7.8	0.4
ACI	115	0	15	1.1	0.7		115	0	15	0	5.5	0.9
AEA	1060	1	3	1.5	-0.1		624	0	3	0	7.0	0.4
AEL	683	1	7	1.8	-0.2		553	0	7	0	6.8	0.7
AEW	80	1	1	1.5	-0.7		50	0	0	0	5.6	0.6
AFL	564	1	4	2.0	0.6		372	1	3	0	7.4	0.8
AFR	1767	1	8	1.9	0.5		1388	0	9	0	7.6	0.5
AJM	389	1	4	1.7	-0.5		292	0	4	0	7.1	0.3
AJX	310	0	7	2.1	0.4		316	0	9	0	9.7	-0.1
AMT	2012	0	44	1.5	0.2		2011	0	45	0	7.4	0.0
AMX	308	3	7	1.6	0.1		210	0	100	0	10.8	-0.2
ANA	79	0	9	1.8	-0.4		80	0	9	0	9.8	-1.2
ANZ	5544	0	24	1.3	0.3		5525	0	24	0	6.2	0.6
ARG	58	5	40	2.4	0.3		46	0	41	0	11.9	2.1
ATN	197	2	100	4.1	-2.9		182	1	30	0	11.2	0.9
AVA	263	0	1	1.5	0.3		157	2	6	0	9.0	0.1
AVN	139	0	50	1.5	0.0		137	0	48	0	5.1	-0.1
AXF	30	0	37	0.8	0.1		30	0	37	0	4.9	0.3
AZA	373	3	8	1.9	0.0		285	0	9	0	10.2	0.4
BAL	440	1	6	1.4	0.1		363	1	9	0	8.0	0.8
BAW	875	1	9	1.8	-0.2		733	0	10	0	8.5	0.0
BBR	135	1	6	1.9	0.7		85	1	4	0	9.0	1.0
BHP	40	0	0	1.3	-0.5		31	0	3	0	8.4	0.6
BPA	498	1	5	1.7	0.0		416	0	6	0	7.2	-0.2
BWA	401	1	6	2.0	-0.1		284	0	4	0	7.6	0.0
CAL	60	0	5	2.1	0.6		64	0	5	0	7.4	-1.0
CCA	352	2	16	2.2	0.0		368	1	100	0	13.8	-0.7
CES	339	2	11	2.3	0.0		339	1	10	0	9.1	1.1
CFC	59	0	7	1.5	-0.5		61	0	8	0	5.7	1.0
CFG	973	0	2	1.2	-0.3		801	0	2	0	6.1	0.4
CKK	190	1	11	1.9	0.4		201	3	16	0	10.4	1.1
CKS	458	1	38	2.1	0.7		438	0	38	0	10.2	0.3
CLX	405	1	5	1.5	-0.6		281	0	5	0	6.3	0.2
COA	284	0	26	1.4	0.1		201	0	21	0	7.5	0.4
CRL	1068	0	4	1.5	0.4		798	0	3	0	7.3	0.5
CSN	115	1	7	1.6	0.2		117	0	9	0	9.8	0.7
CUB	209	1	4	1.8	0.0		167	0	3	0	6.5	0.6
DAF	27	4	19	3.0	-1.9		22	0	0	0	7.7	2.9
DAL	3222	0	40	1.5	0.0		2970	0	43	0	6.4	0.0
DCS	48	0	6	1.9	0.2		38	3	3	0	5.4	-0.4
DHL	115	2	100	6.1	-5.8		86	0	100	0	14.9	1.7
DLH	1028	0	14	1.6	0.0		971	0	15	0	7.6	0.9
EDW	103	0	6	1.7	-0.1		83	0	4	0	6.3	0.2
EEZ	128	2	5	1.7	0.1		103	0	8	0	9.7	0.0
EIA	301	2	100	2.5	0.7		297	0	100	0	16.4	5.0
ELY	174	1	6	1.7	-0.1		133	1	9	0	9.0	1.1
ETH	28	0	18	1.2	0.0		29	0	17	0	4.8	2.4
EVA	171	0	5	1.2	-0.2		191	1	8	0	8.1	0.2
FCA	133	1	4	1.7	0.3		95	1	6	0	9.1	0.1
FDX	2004	1	41	1.5	0.2		1847	0	41	0	7.5	0.2
FIN	246	1	6	1.7	0.2		191	1	6	0	6.3	0.7
FJI	805	0	36	1.7	1.1		794	0	36	0	6.7	1.2
FOM	776	0	28	1.3	0.0		773	0	29	0	7.2	-0.2
FWI	466	1	5	1.7	-0.2		402	0	4	0	7.2	0.4
GAF	33	3	9	2.3	-1.5		24	0	4	0	5.5	1.7
GCO	255	0	11	1.5	-0.1		201	0	16	0	9.9	1.6

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	PG	WIND		RMS	BIAS
		PG	PR	RMS	PR				PC			
GHA	59	0	3	1.9	-0.2		42	0	5	0	10.0	1.5
GRL	78	1	6	2.1	0.5		73	0	3	0	7.4	0.3
GTI	245	0	12	1.7	0.3		242	0	11	0	7.3	1.3
HAL	4999	1	42	1.9	0.0		4956	0	41	0	7.2	0.3
HRH	88	0	51	1.3	0.4		88	0	51	0	5.8	0.2
HXL	197	0	9	1.9	0.6		161	1	12	0	8.0	1.0
IBE	3163	1	5	1.6	0.2		2124	1	7	0	8.7	0.4
ICE	824	0	2	1.5	-0.4		566	0	2	0	6.5	0.7
IWD	224	1	2	1.6	0.2		148	0	1	0	5.5	1.0
JAL	2865	0	4	1.8	0.4		2851	0	5	0	8.4	0.1
JAZ	639	0	5	1.7	0.5		642	0	6	0	9.3	0.5
JBU	47	0	2	1.2	-0.5		46	0	0	0	3.8	0.2
KAL	2144	1	10	1.9	-0.1		2149	0	10	0	8.5	0.5
KLM	1532	0	4	1.6	0.0		1099	0	4	0	6.7	0.0
LAN	547	1	3	1.5	0.1		546	0	4	0	6.7	0.2
LAP	108	5	48	2.4	0.5		103	0	43	0	9.2	-0.6
LDA	51	0	27	3.8	2.4		43	0	9	0	7.0	1.1
LDI	584	1	4	1.5	0.0		407	0	5	0	8.2	-0.3
LNE	94	1	3	1.7	-0.7		61	2	5	0	9.1	-0.6
LOT	109	0	1	1.9	-1.3		80	3	4	0	5.7	0.5
LTU	1058	1	6	1.6	-0.2		825	0	4	0	6.4	0.7
MAS	207	1	8	2.0	0.2		192	0	5	0	7.4	-0.9
MON	87	0	3	1.5	0.0		65	0	3	0	5.2	1.2
MPD	381	1	3	1.7	0.5		250	0	3	0	6.3	0.7
MPH	673	0	3	1.8	-1.0		520	0	5	0	8.3	0.4
MXA	75	9	24	3.3	0.3		77	0	17	0	15.1	-2.2
MYT	308	0	5	1.9	0.2		246	0	5	0	7.5	0.0
NAO	563	0	23	1.6	0.1		556	0	25	0	8.1	0.6
NCA	1207	0	3	1.5	0.2		915	0	4	0	7.1	0.5
NWA	8174	1	13	1.7	0.0		8116	0	13	0	7.8	0.4
NZL	2495	0	19	1.3	-0.1		2495	0	19	0	5.0	0.2
OAE	724	0	34	1.3	-0.2		657	0	100	0	10.7	1.9
PAC	492	0	11	1.7	-0.5		437	0	12	0	7.7	0.9
PAL	1423	0	11	1.7	0.1		1385	0	14	0	9.4	0.3
PAO	226	1	46	1.4	0.3		226	0	46	0	7.4	0.1
PBI	443	0	29	1.8	-0.2		439	1	29	0	6.2	0.0
PLM	210	0	3	1.6	0.3		120	1	100	0	6.8	1.0
PUA	29	3	48	2.8	-1.2		24	0	50	0	21.0	-2.3
QFA	3789	0	41	1.3	0.5		3780	0	41	0	5.7	0.6
QQA	66	0	44	1.3	0.8		66	0	44	0	6.4	-0.1
RAM	276	1	5	1.8	0.3		133	1	100	0	9.4	1.0
RCH	375	0	100	3.3	-0.9		280	0	100	0	12.5	1.0
RRR	42	0	10	1.6	-0.3		42	0	17	0	10.5	0.9
RZO	413	0	5	1.6	-0.5		209	0	6	0	8.7	-0.4
SAA	268	0	3	1.7	-0.8		202	0	4	0	9.0	0.9
SEU	652	1	5	1.8	0.1		561	0	3	0	6.5	0.4
SIA	399	0	1	1.3	0.5		396	0	1	0	4.7	0.3
SOO	34	9	15	1.5	0.5		42	0	7	0	5.6	0.4
SQC	48	0	4	1.1	0.6		48	0	4	0	5.0	-1.2
SVH	23	0	4	1.4	1.0		23	0	4	0	5.6	0.7
TAM	68	12	32	2.5	1.0		67	0	28	0	14.5	0.8
TAP	534	1	5	1.4	-0.4		238	0	10	0	8.5	0.5
TCX	139	1	4	1.3	0.2		114	0	4	0	7.9	0.8
THA	147	0	10	1.7	0.2		147	0	9	0	8.3	0.3
THT	138	0	30	1.6	0.1		124	0	31	0	7.6	2.0
TPA	42	0	5	0.9	0.1		32	0	6	0	9.6	0.6
TSC	34	0	0	1.4	-0.4		23	0	4	0	9.5	-1.1
UAE	519	0	6	1.2	0.4		519	0	6	0	4.6	0.5
UAL	280360	0	96	1.2	-0.1		280213	0	96	0	5.2	0.5

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
UPS	2068	0	55	1.5	0.1		2021	0	56	0	7.2	0.4
USA	171	0	2	1.7	0.2		128	0	6	0	8.0	1.3
VHF	29	0	3	1.1	-0.3		29	0	3	0	5.3	-1.5
VIR	170	0	2	1.6	-0.1		113	0	2	0	5.7	0.9
VPB	42	14	17	1.9	1.2		25	0	8	0	8.5	1.9
VRG	145	1	32	2.4	0.8		144	0	100	0	11.2	0.2
VVJ	36	0	36	1.7	-0.3		37	0	35	0	7.0	-1.7
VVR	95	6	32	2.3	0.9		91	0	29	0	7.4	1.9
WOA	504	0	14	1.6	0.2		462	0	15	0	8.0	0.5
XLA	184	1	3	1.2	0.3		145	0	4	0	7.4	0.1
YSS	34	0	0	1.2	0.6		28	0	4	0	8.0	-0.7

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
AU	38388	0	9	1.3	0.6		38439	0	9	0	5.1	0.5
EU	174795	0	23	1.2	0.2		174795	0	22	0	4.6	0.5
KL	1983	0	1	2.1	1.3		1983	0	1	0	6.0	0.1
LN	57	0	40	2.0	0.2		55	0	45	0	12.9	2.1
MK	2844	0	7	1.5	1.0		2822	0	7	0	6.9	1.4
SA	4329	0	40	1.6	1.1		4329	0	16	0	5.9	0.4
TN	49	0	29	2.1	-0.2		49	0	29	0	6.7	0.3

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
N	1283	2	27	2.2	0.5		1162	0	28	0	8.7	0.6
U	1046176	0	65	1.3	0.3		1046171	0	65	0	5.3	0.6

TABLE 4B

**MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Mar 2004**

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:1000.0 – 300.1 hPa
Elements monitored		:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

IDENT.	N.REP.	TEMPERATURE				N.REP.	PG	WIND			
		PG	PR	RMS	BIAS			PR	PC	RMS	BIAS
AAH	22	0	50	2.5	-1.1	22	0	50	0	8.2	-0.5
AAL	540	0	43	1.5	0.0	524	0	44	0	6.6	-0.3
AAR	24	8	21	2.0	-0.6	24	0	17	0	13.0	-0.4
ACA	24	0	29	3.7	-1.5	21	0	24	0	11.3	0.5
AFR	94	0	2	1.4	0.4	76	0	4	0	8.2	-0.6
AME	94	6	16	2.6	-0.1	81	0	11	0	7.9	1.8
AMT	84	0	38	2.0	0.2	84	0	42	0	11.6	-0.4
ANZ	198	1	23	1.0	0.0	197	0	23	0	5.7	-0.3
AXF	28	7	64	1.7	0.8	30	0	60	0	9.9	-0.4
BAF	36	6	11	1.8	-0.3	28	0	14	0	14.5	-0.8
CFC	103	2	4	1.3	0.4	100	0	2	0	5.5	0.0
CFG	27	0	4	0.8	-0.4	25	0	0	0	5.7	0.0
CKS	39	0	8	1.4	0.0	33	0	6	0	6.9	1.6
CLX	39	0	8	1.6	-0.9	25	0	4	0	5.0	0.5
CRL	48	0	4	1.6	0.2	42	2	17	0	11.2	1.0
DAL	384	0	46	1.2	0.1	364	0	49	0	6.3	-0.1
DLH	398	1	10	1.5	-0.1	391	0	11	0	6.2	0.4
FDX	622	0	28	1.6	0.2	545	0	28	0	7.8	1.4
FIN	42	0	10	1.1	-0.2	30	0	10	0	5.4	1.2
GAF	29	3	3	1.0	0.0	22	0	0	0	4.8	-0.1
GCO	146	0	4	1.4	-0.1	102	0	12	0	11.6	1.2
HAL	541	2	44	1.5	0.0	541	0	43	0	8.0	-0.3
IBE	41	0	0	1.0	0.2	30	0	3	0	7.3	1.1
ICE	47	0	2	1.6	-1.1	28	0	0	0	5.9	0.5
JAL	156	2	12	2.0	0.3	153	0	11	0	8.6	0.4
JAZ	57	2	7	1.7	0.6	51	0	10	0	9.6	-0.2
JKK	24	0	38	1.2	0.2	23	0	43	0	8.0	-0.9
KAL	39	0	10	1.4	-0.6	38	0	13	0	8.5	-1.8
KIW	28	0	50	1.7	1.0	28	0	50	0	7.6	1.3
KLM	47	0	2	1.5	0.1	39	0	8	0	10.2	1.3
LAN	42	0	2	1.3	0.6	37	0	5	0	8.9	0.9
MPH	141	4	7	1.6	-0.2	117	0	14	0	12.9	2.1
MYT	24	4	13	3.7	2.3	22	0	0	0	5.5	0.5
NCA	85	0	0	1.4	0.1	76	0	0	0	5.9	0.6
NWA	465	0	15	1.7	0.2	467	0	16	0	8.8	-0.2
NZL	21998	0	59	1.3	0.2	21997	0	59	0	4.7	0.2
OAE	71	0	25	1.1	-0.1	61	0	100	0	15.6	3.4
PAC	29	0	7	1.7	-0.7	27	0	7	0	5.1	-0.7
PAL	76	1	32	1.2	-0.6	75	0	35	0	7.8	0.2
QFA	396	2	45	1.6	0.0	402	0	42	0	5.6	0.0
RCH	38	0	100	1.6	-0.2	38	0	100	0	13.0	1.8
RRR	86	5	29	3.3	1.6	85	0	19	0	9.6	1.2
SIA	78	0	1	1.4	0.5	78	0	1	0	4.7	0.1
SVH	6636	0	62	1.6	0.9	6636	0	62	0	4.0	0.5
UAE	102	0	2	1.3	0.5	102	0	2	0	4.8	0.1
UAL	414859	0	98	1.1	-0.1	414371	0	98	0	4.5	0.3
UPS	242	1	50	1.4	-0.3	241	0	51	0	7.7	1.1
VVP	21	0	48	2.7	2.0	21	0	43	0	10.8	4.6
WOA	204	5	15	2.5	0.1	177	0	18	0	10.7	2.3

IDENT.	N.REP.	TEMPERATURE				N.REP.	PG	WIND			
		PG	PR	RMS	BIAS			PR	PC	RMS	BIAS
AU	28098	0	49	1.1	0.2	28157	0	49	0	3.9	0.0
EU	656407	0	68	1.0	0.2	655426	0	68	0	3.8	0.0
KL	1095	0	55	2.2	0.9	1095	0	55	0	4.6	-0.5
MK	1771	0	54	1.4	0.6	1757	0	54	0	4.5	0.5
SA	2710	0	69	1.6	0.4	2711	0	66	0	4.3	0.1

IDENT.	N.REP.	TEMPERATURE				N.REP.	PG	WIND			
		PG	PR	RMS	BIAS			PR	PC	RMS	BIAS

N	20	15	25	2.5	1.4	21	0	10	0	6.9	-1.5
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IDENT.	N.REP.	TEMPERATURE				N.REP.	PG	WIND		RMS	BIAS
		PG	PR	RMS	BIAS			PR	PC		
U	1791756	0	77	1.2	0.3	1787173	0	78	0	4.4	0.2

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. MARCH 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 94357

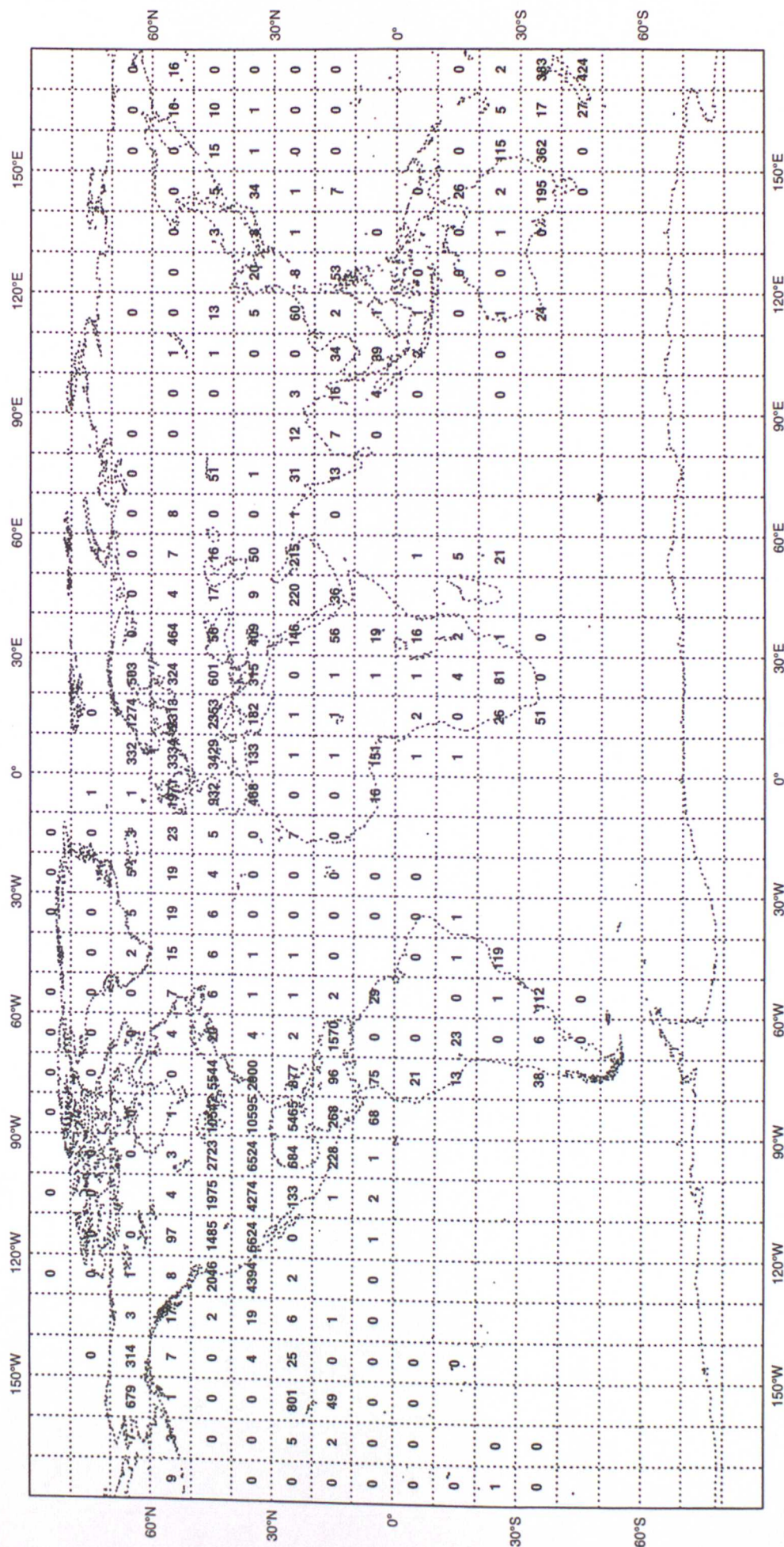
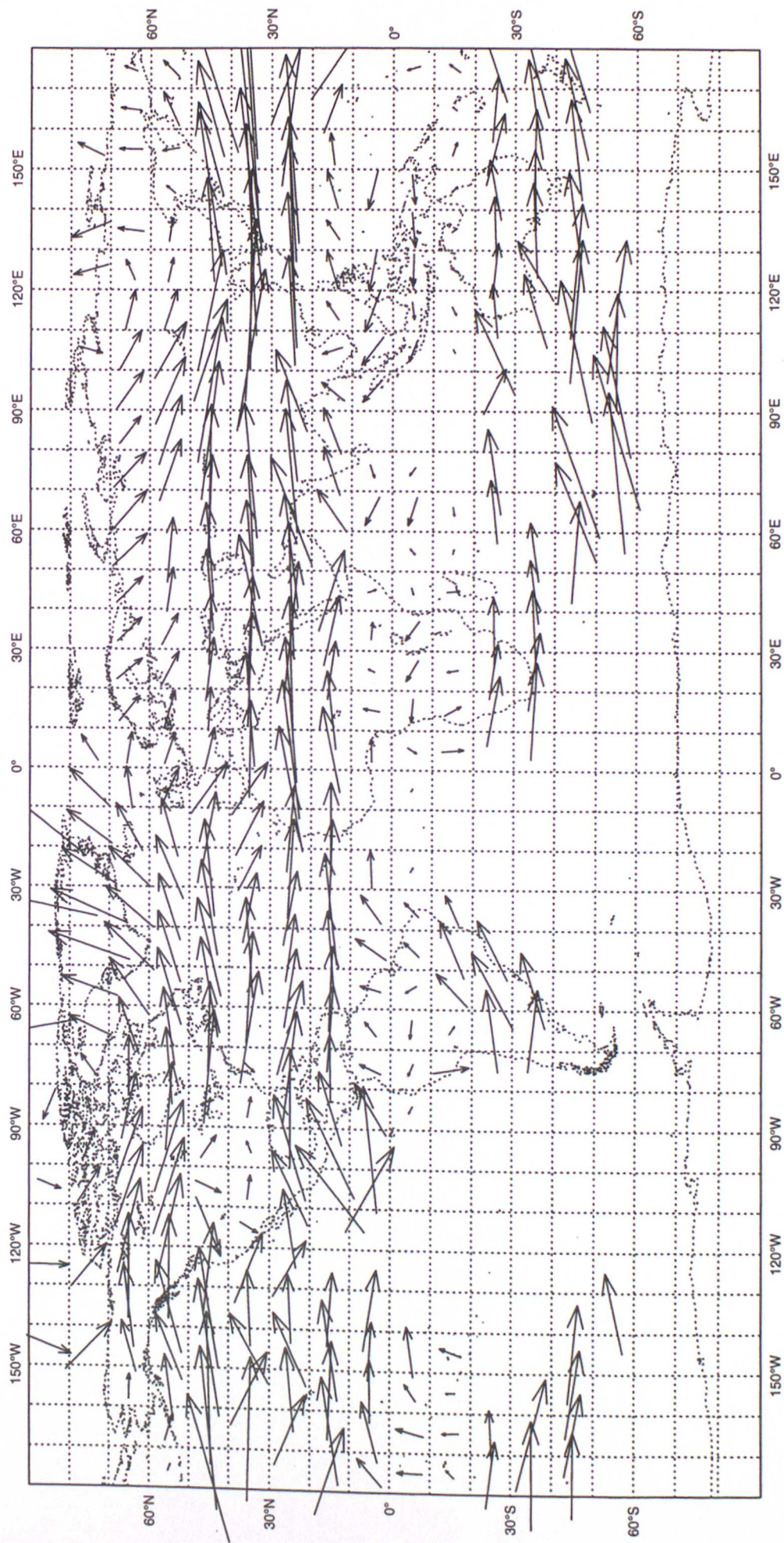
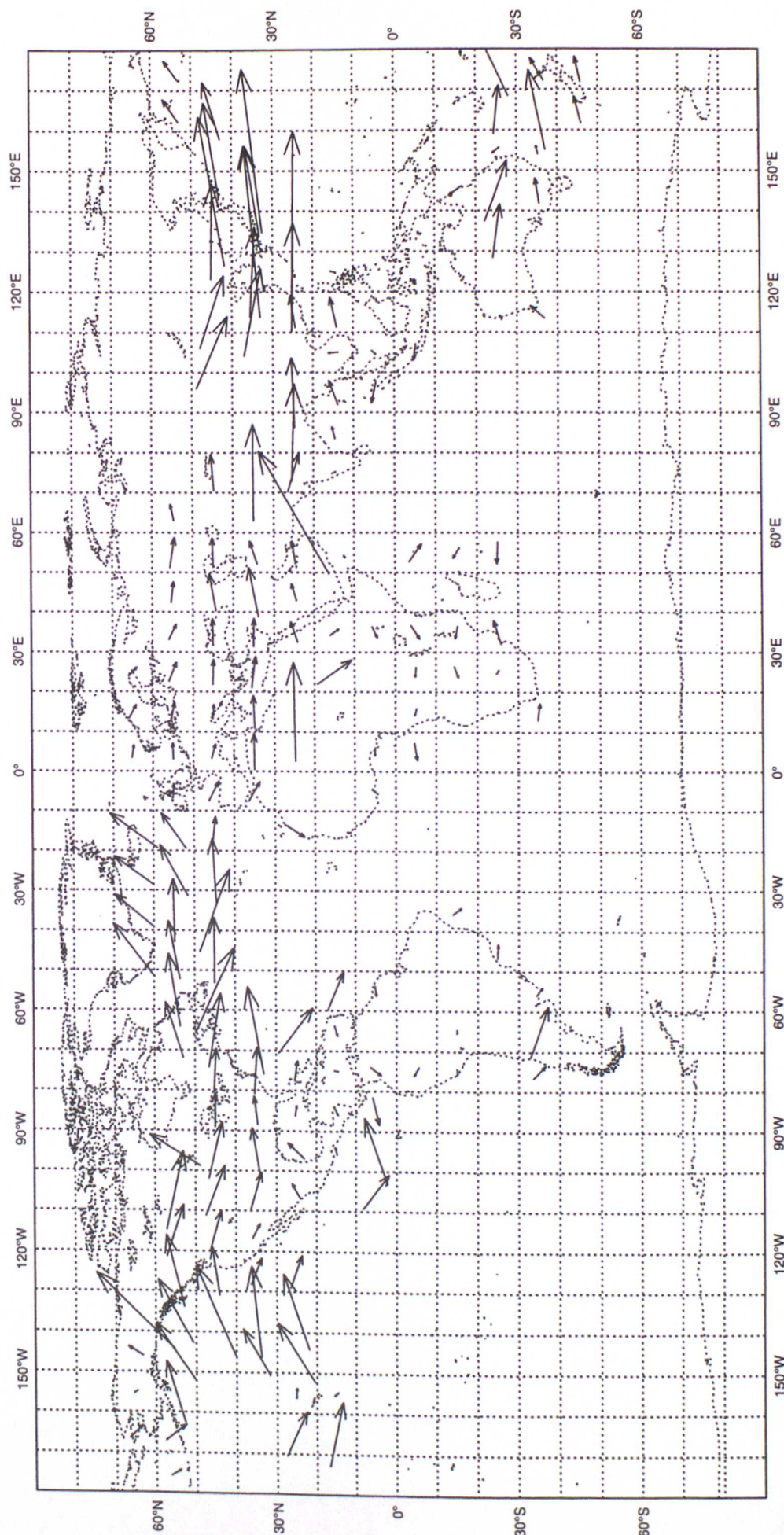


Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present



15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present



15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present

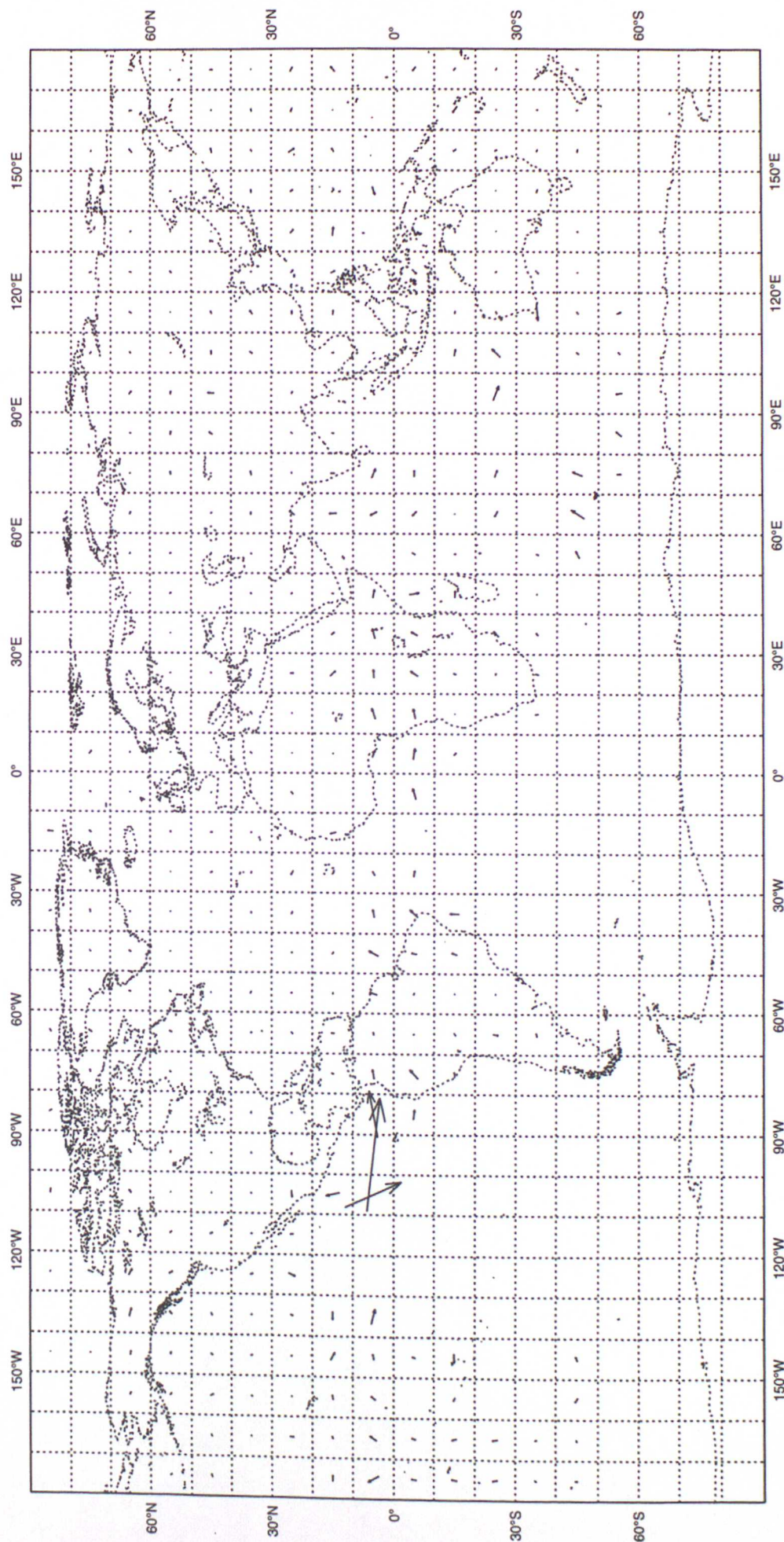


Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present

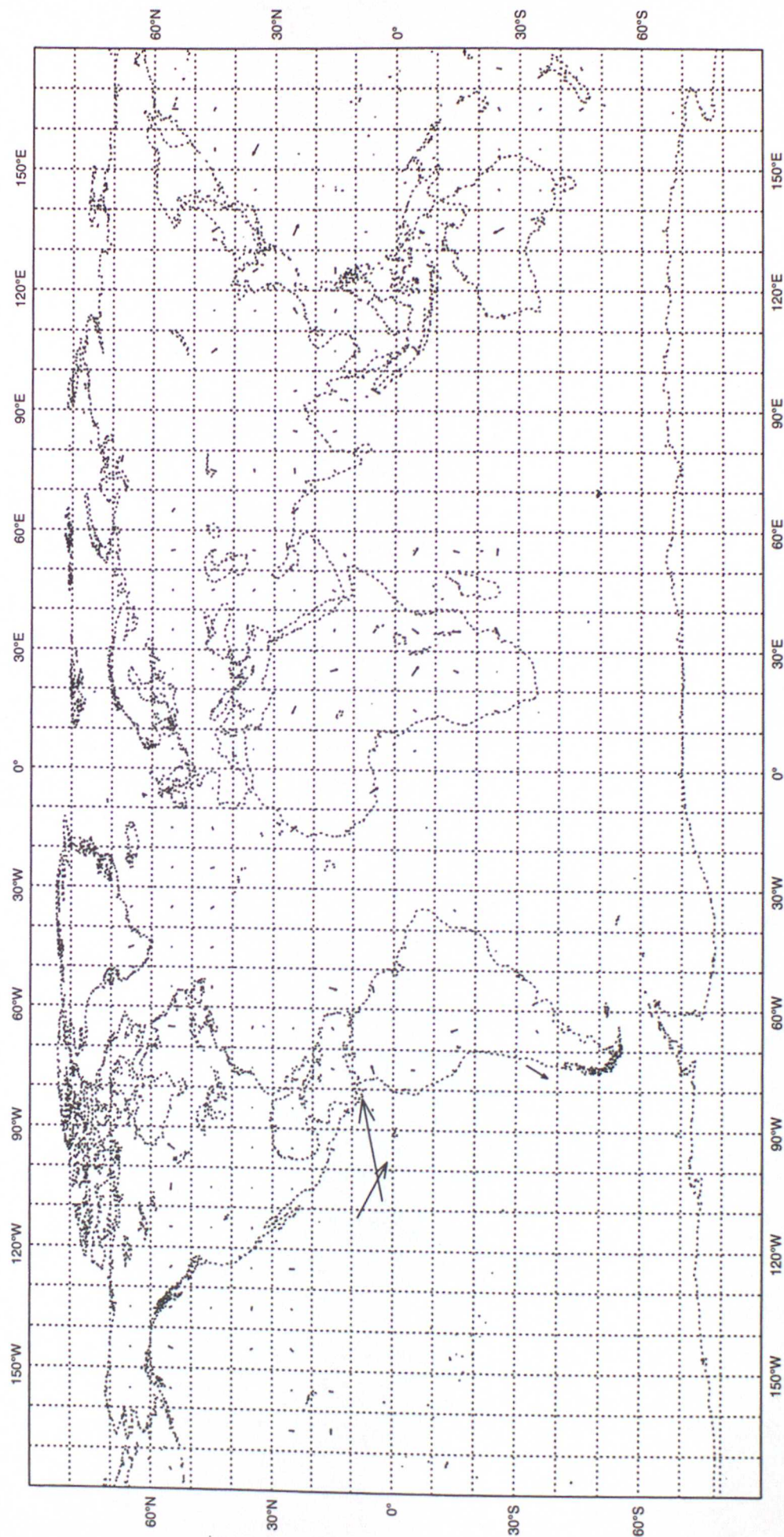


Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Values are printed where greater than 30 obs are present

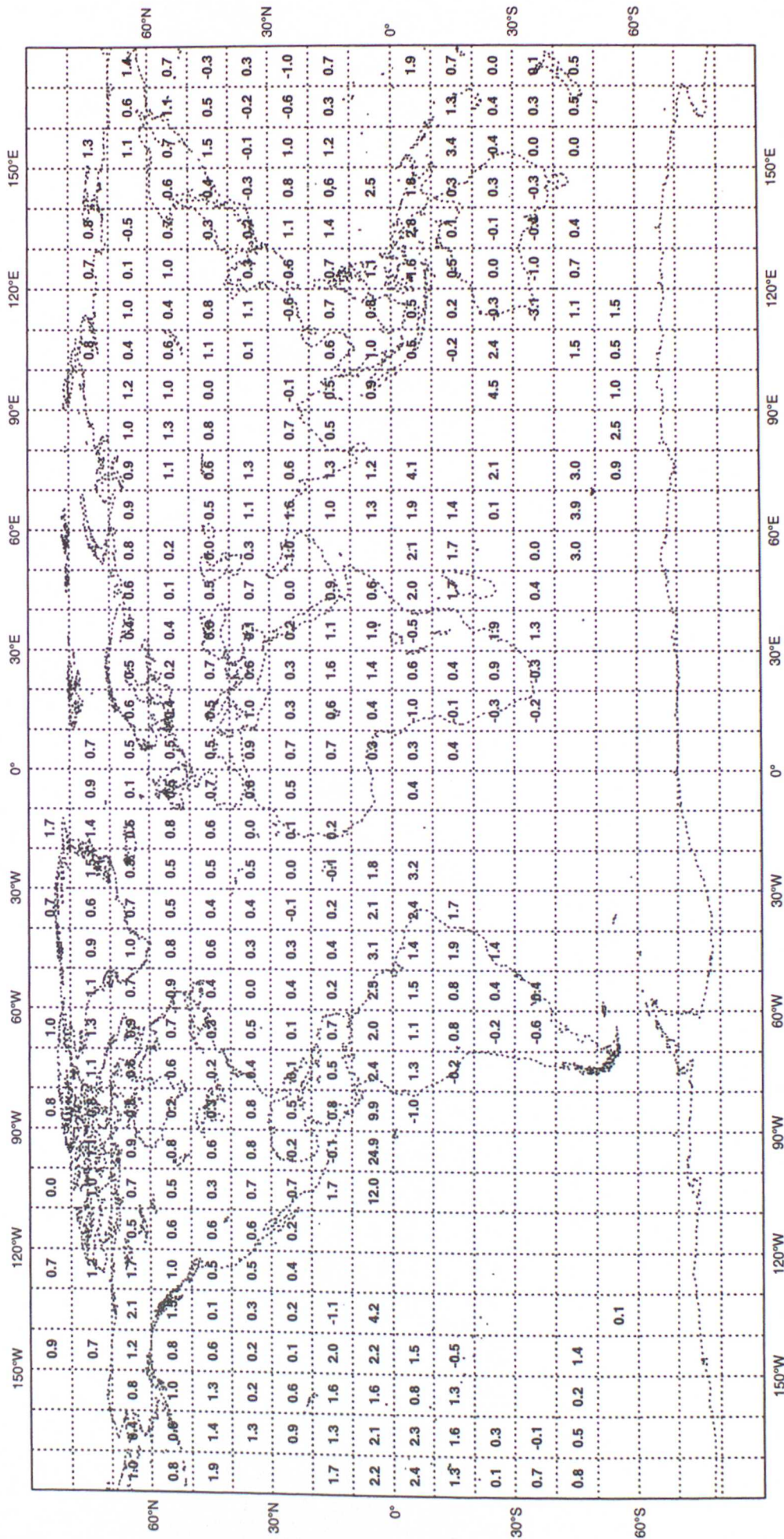


Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Values are printed where greater than 30 obs are present

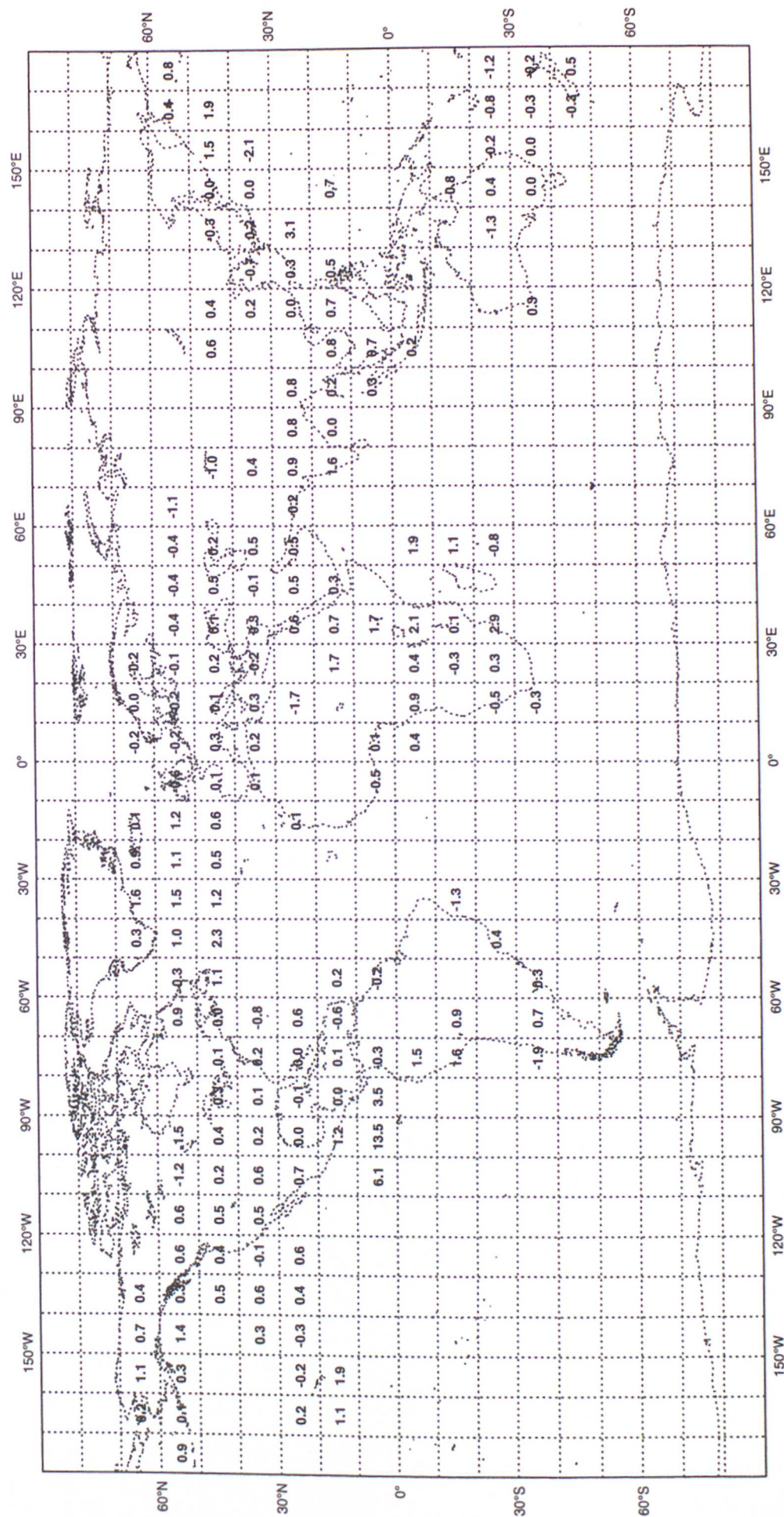


Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). MARCH 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Values are printed where greater than 30 obs are present

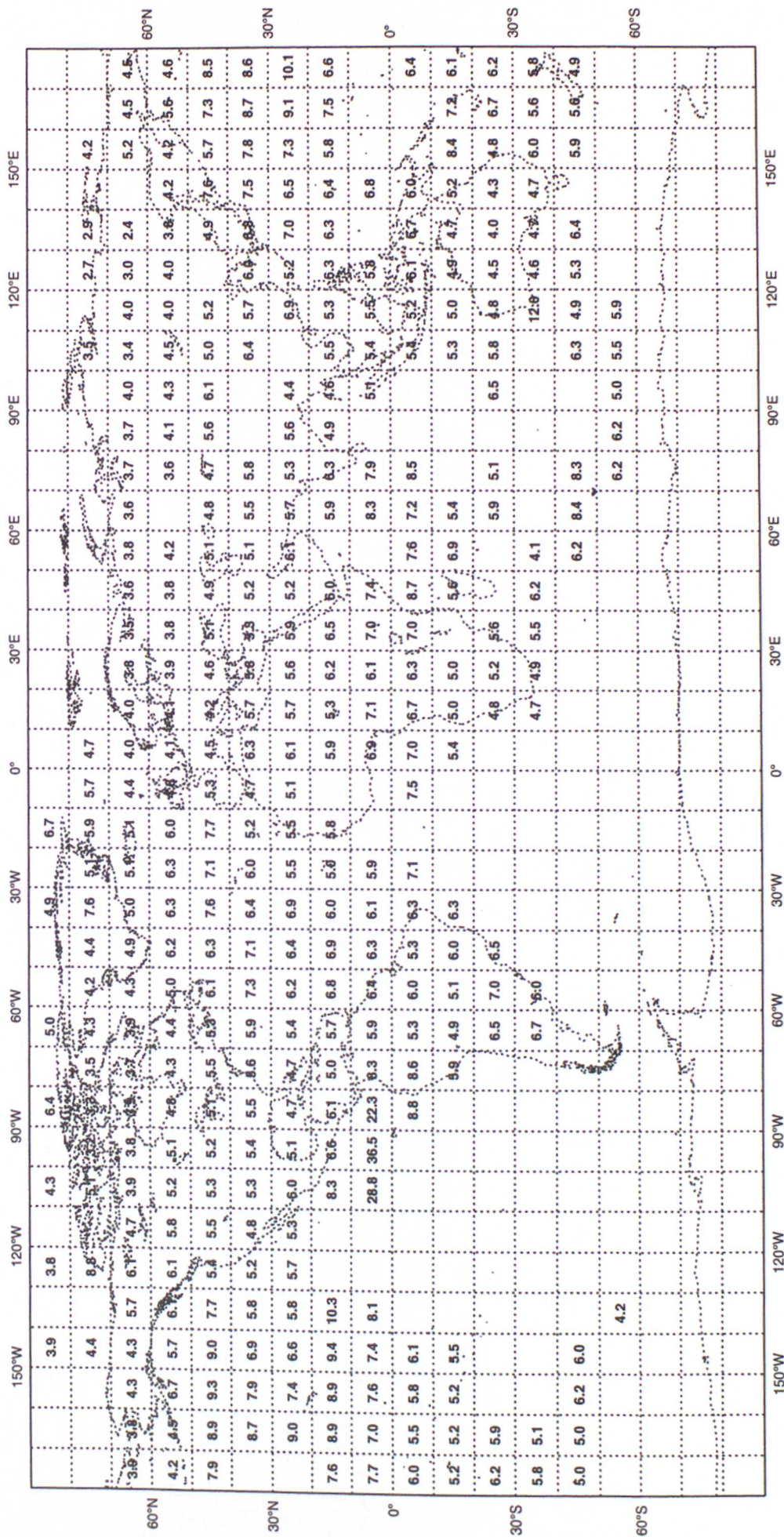


Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms⁻¹). MARCH 2004
 Observations with O-B vector difference greater than 60 ms⁻¹ excluded
 Values are printed where greater than 30 obs are present

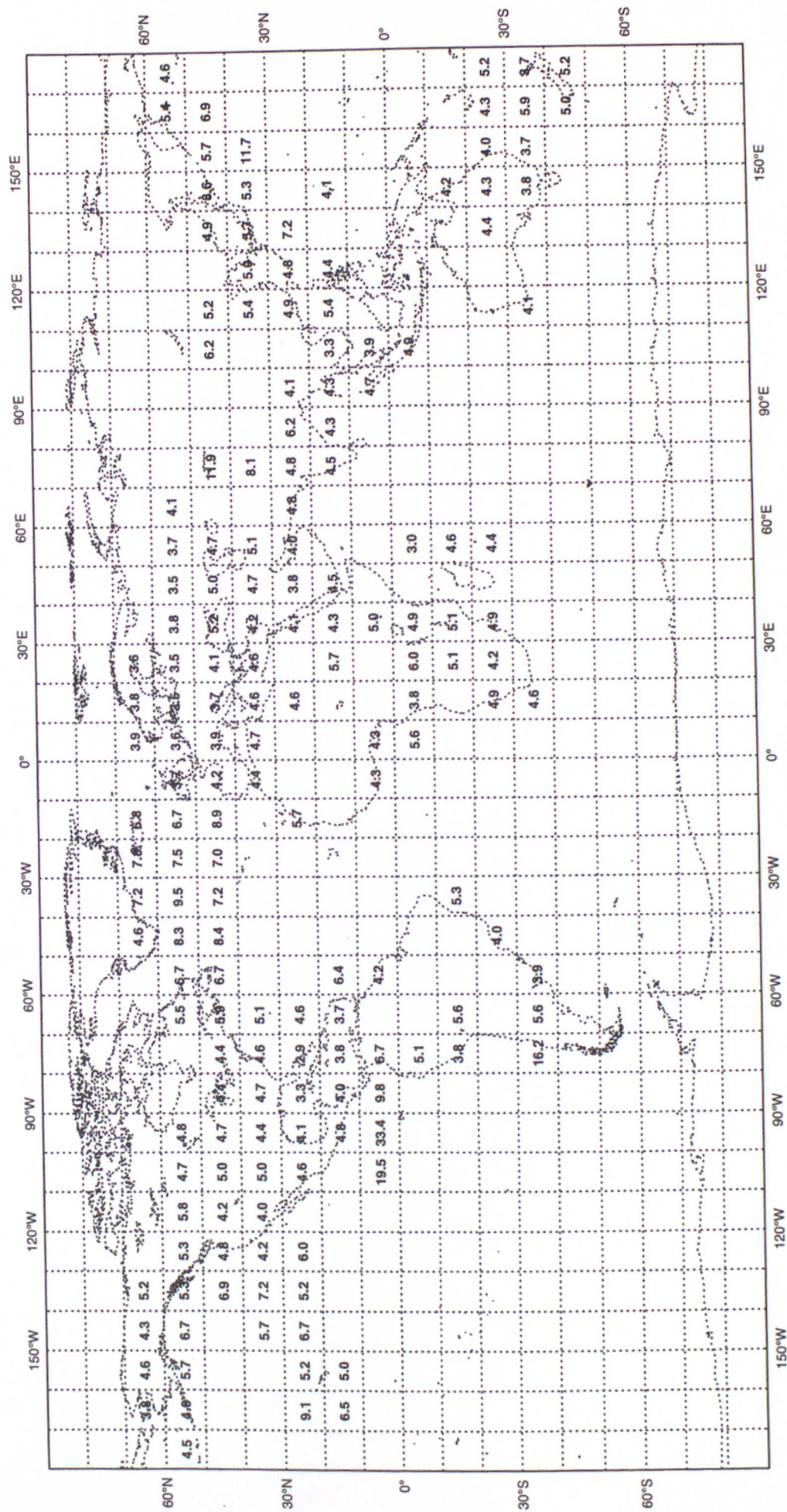


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
22113	00	Z	150	69/ 33	26	0	92.6	-143.3	170.7	8
22113	12	Z	1000	69/ 33	26	4	34.1	-27.0	43.5	5
27459	12	Z	1000	56/ 44	26	4	28.1	-19.6	34.3	4
35229	12	Z	1000	50/ 57	13	16	24.1	-56.5	61.5	5
42101	00	Z	200	30/ 76	26	0	89.0	-22.8	91.8	5
42101	12	Z	70	30/ 76	15	0	124.2	102.7	161.2	4
42182	00	Z	1000	29/ 77	1	26	0.0	-93.0	93.0	10
42182	12	Z	1000	29/ 77	1	27	0.0	-87.0	87.0	10
42314	00	Z	150	27/ 95	19	0	95.5	-52.4	108.9	5
42339	00	Z	150	26/ 73	7	3	107.6	-97.7	145.4	6
42361	00	Z	1000	26/ 78	2	25	11.5	-75.5	76.4	5
42361	12	Z	1000	26/ 78	1	22	0.0	-82.0	82.0	5
42369	00	Z	1000	27/ 81	15	2	21.3	-60.1	63.7	6
42369	12	Z	1000	27/ 81	18	5	34.4	-58.8	68.1	8
42379	00	Z	200	27/ 83	18	1	66.6	-93.2	114.5	5
42410	00	Z	1000	26/ 92	2	26	8.0	-60.0	60.5	4
42410	12	Z	1000	26/ 92	2	23	7.0	-89.0	89.3	5
42647	00	Z	250	23/ 73	17	0	73.0	-24.7	77.1	4
42647	12	Z	250	23/ 73	10	1	61.3	102.3	119.2	4
42701	00	Z	250	23/ 85	25	0	92.5	-21.7	95.0	8
42701	12	Z	70	23/ 85	10	0	109.7	114.3	158.4	5
42809	00	Z	150	23/ 88	12	0	100.7	-50.8	112.8	6
42809	12	Z	100	23/ 88	17	1	129.6	0.6	129.6	6
42867	00	Z	200	21/ 79	10	1	50.5	-91.9	104.9	6
42867	12	Z	150	21/ 79	13	1	90.6	48.1	102.6	4
42971	12	Z	70	20/ 86	15	0	135.0	114.4	176.9	8
43003	00	Z	1000	19/ 73	25	2	9.7	-74.2	74.8	12
43003	12	Z	1000	19/ 73	28	2	9.1	-81.1	81.7	8
43014	00	Z	200	20/ 75	10	0	96.4	38.5	103.8	5
43014	12	Z	250	20/ 75	17	0	71.9	65.1	97.0	5
43128	00	Z	850	17/ 78	27	3	24.7	23.6	34.1	6
43128	12	Z	70	17/ 78	9	3	132.9	191.6	233.1	10
43150	00	Z	1000	18/ 83	19	10	14.3	-83.4	84.6	4
43150	12	Z	1000	18/ 83	12	15	30.5	-70.3	76.6	4
43185	00	Z	200	16/ 81	21	1	119.9	-17.4	121.1	11
43185	12	Z	100	16/ 81	10	0	171.1	64.3	182.7	9
43285	12	Z	1000	13/ 75	3	25	9.3	-90.0	90.5	8
43295	12	Z	70	13/ 78	8	2	150.6	195.9	247.1	10
43311	00	Z	200	11/ 73	21	0	71.8	-85.7	111.7	4
43346	00	Z	50	11/ 80	13	1	128.1	132.8	184.5	5
43346	12	Z	100	11/ 80	15	3	120.1	93.7	152.4	8
43353	00	Z	1000	10/ 76	21	5	7.6	-84.6	84.9	7
43369	00	Z	150	8/ 73	9	1	129.2	55.6	140.6	7
43369	12	Z	200	8/ 73	13	1	89.7	106.2	139.0	6
43371	00	Z	70	8/ 77	11	1	114.9	-191.2	223.0	10
43371	12	Z	50	8/ 77	14	1	107.9	150.6	185.3	6
58968	00	Z	1000	25/ 122	27	0	20.2	-36.9	42.1	5
78073	12	Z	1000	25/ -77	11	4	33.2	-19.0	38.2	7
97014	00	Z	150	2/ 125	13	0	92.5	-87.6	127.4	5

All hours

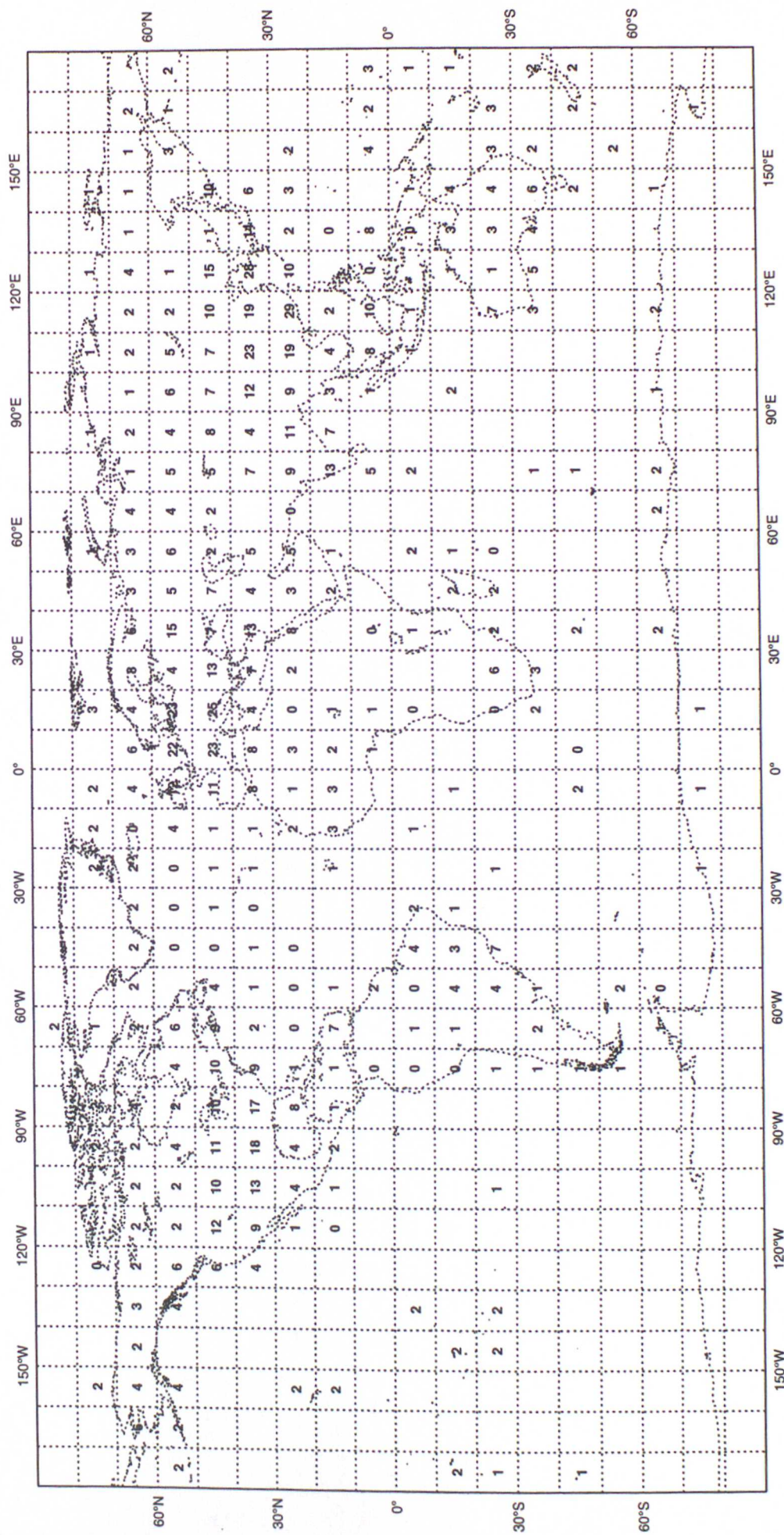


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.	
Area monitored	:90°N - 90°S, 180°W - 180°E.	
Standard of comparison	:Background field from UKMO global model.	
Observation times	:00 UTC and 12 UTC.	
Level(s) monitored	:Standard levels between 1000.0 - 100.0 hPa	
Element monitored	:VECTOR WIND in m s^{-1}	
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and $\geq 15 \text{ m s}^{-1}$ RMS vector wind.	
	ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN	

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
OXTS2	00	V	250	61/ -49	11	0	9	-7.4	-3.4	21.0	4
08594	12	V	150	17/ -23	25	0	100	-7.1	6.7	24.8	1
40809	12	V	300	33/ 59	16	0	100	-7.8	-0.5	16.5	1
42182	00	V	200	29/ 77	24	0	95	-13.6	-7.6	21.4	5
42182	12	V	150	29/ 77	19	0	100	-4.9	-7.4	16.1	2
42369	00	V	250	27/ 81	10	0	100	-1.6	-5.5	17.0	1
42379	00	V	250	27/ 83	11	0	100	-4.1	-7.0	15.4	1
42410	00	V	400	26/ 92	23	0	100	4.2	5.8	17.3	2
47058	00	V	400	39/ 126	10	0	100	-11.8	1.8	18.0	1
58968	00	V	250	25/ 122	27	0	14	-3.9	-4.9	18.1	4
60490	12	V	200	36/ -1	14	0	100	3.2	3.8	15.6	2
60549	12	V	250	34/ 0	11	0	9	-5.0	-3.3	23.8	4
62378	00	V	150	30/ 31	28	1	100	-17.5	-3.6	22.2	3
62378	12	V	150	30/ 31	28	0	100	-19.7	0.0	22.4	3
62403	12	V	150	26/ 33	20	0	15	8.4	2.8	16.6	1
62414	00	V	200	24/ 33	30	0	3	-2.7	0.4	16.3	1
62423	00	V	150	27/ 28	26	0	3	-8.4	-0.4	24.9	1
62423	12	V	150	27/ 28	25	0	4	-7.7	4.2	27.3	1
68512	12	V	150	-30/ 18	18	0	100	-0.9	0.9	15.2	1
68538	12	V	250	-31/ 24	14	0	7	-1.8	-0.3	16.6	1
68842	12	V	300	-34/ 26	12	0	16	-9.4	2.3	15.6	1
72376	00	V	250	37/-108	30	0	100	-2.1	-0.4	15.4	1
72403	12	V	400	39/ -77	30	0	3	-2.1	-2.2	16.9	1
97072	00	V	300	-1/ 120	10	0	10	-1.6	1.2	15.7	2

All hours

Global average number of observations in 24 hours = 1295

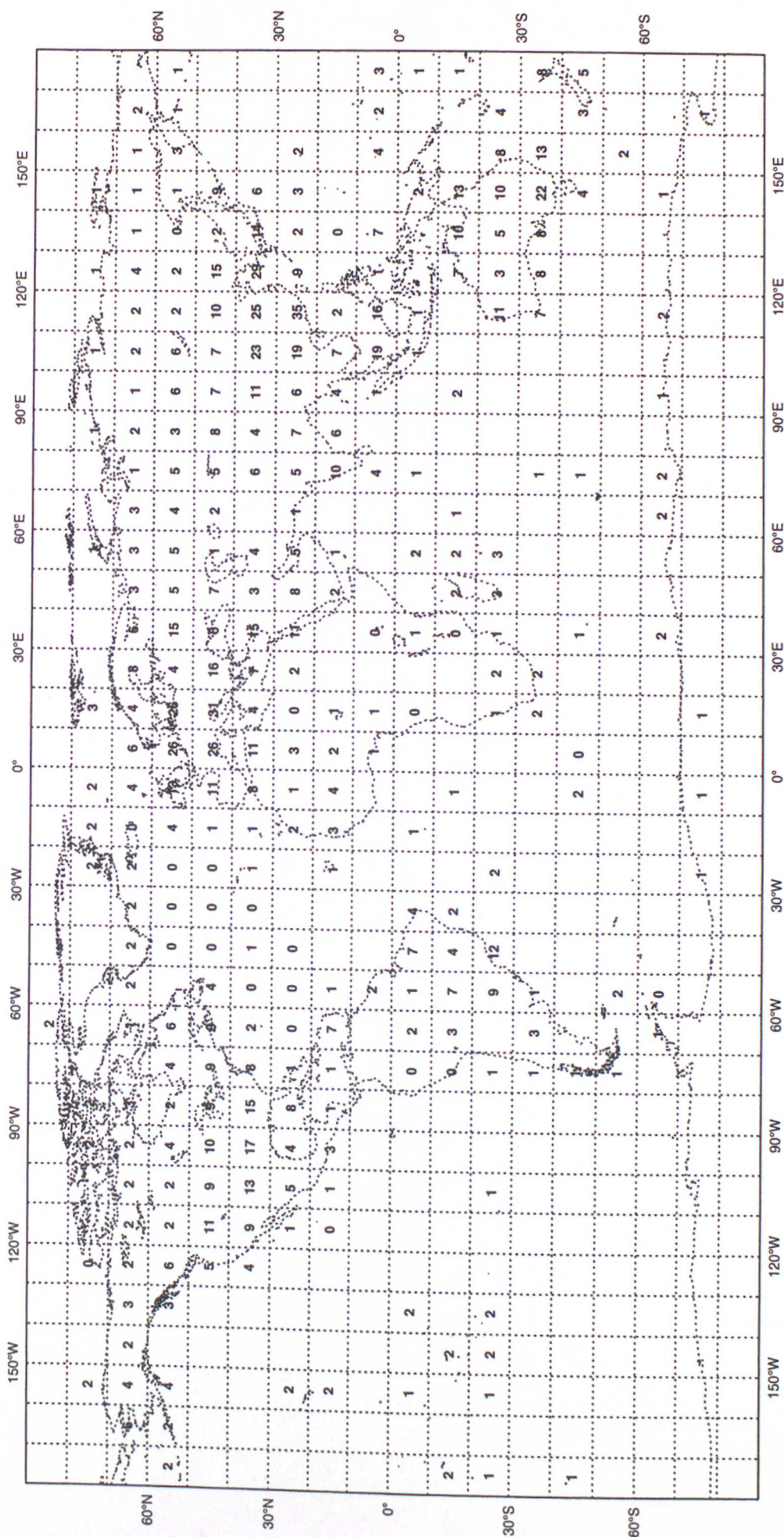


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 500.0 - 150.0 hPa
Element monitored	:WIND DIRECTION in degrees
Parameters monitored	
	:NUM OBS :Average number of observations at all levels.
	:BIAS :Mean difference of observations from background values from all levels.
	:MAX SPREAD : (For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD :SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5 , and ABSOLUTE BIAS $\geq 10^\circ$, with SD $< 30^\circ$, and MAX SPREAD $< 10^\circ$

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	23	-11.0	2.6	8.4
42182	00	DD	29/ 77	23	11.8	2.3	9.7
42379	12	DD	27/ 83	10	16.4	3.8	14.2
62337	00	DD	31/ 34	27	-13.5	6.0	8.4
62337	12	DD	31/ 34	27	-14.0	3.1	7.0
78954	12	DD	13/ -59	19	-16.1	3.6	12.8
96749	00	DD	-6/ 107	11	-12.3	7.5	27.0

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: Mar 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. MARCH 2004
Global average number of observations in 24 hours = 86857

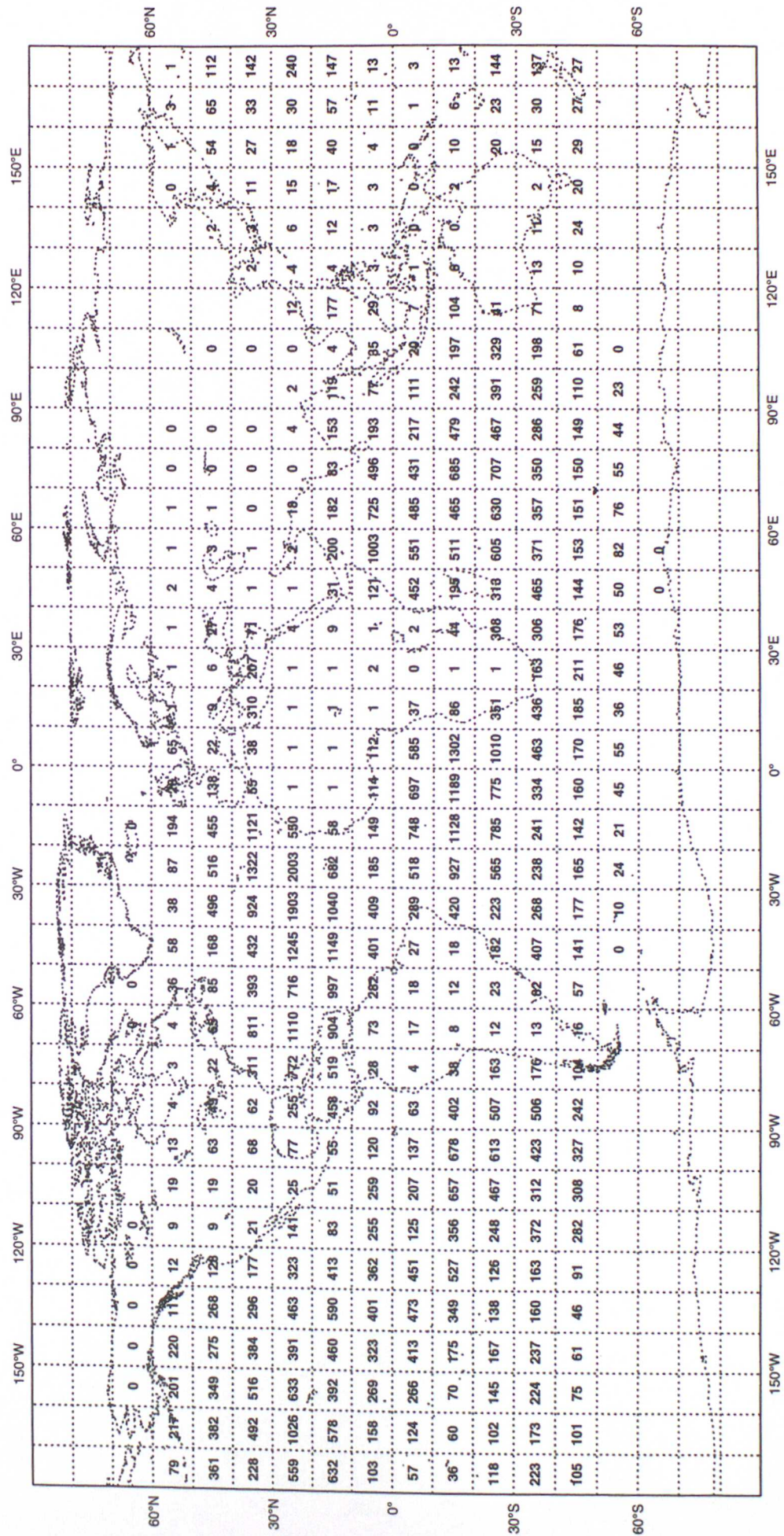


Figure 11. SATOB 701 - 1000 hPa vector mean wind. MARCH 2004
All observations
Arrows are plotted where greater than 10 obs are present

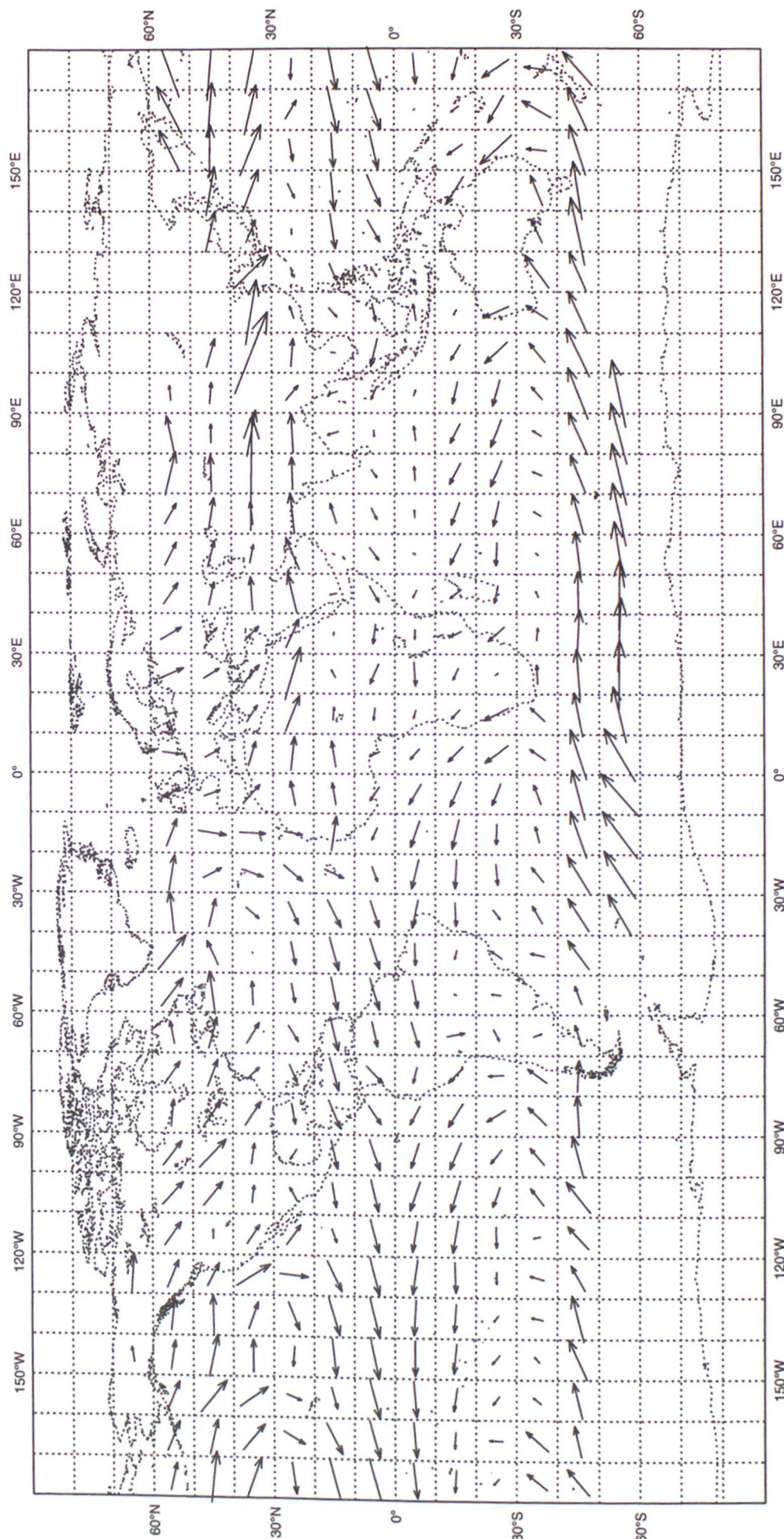
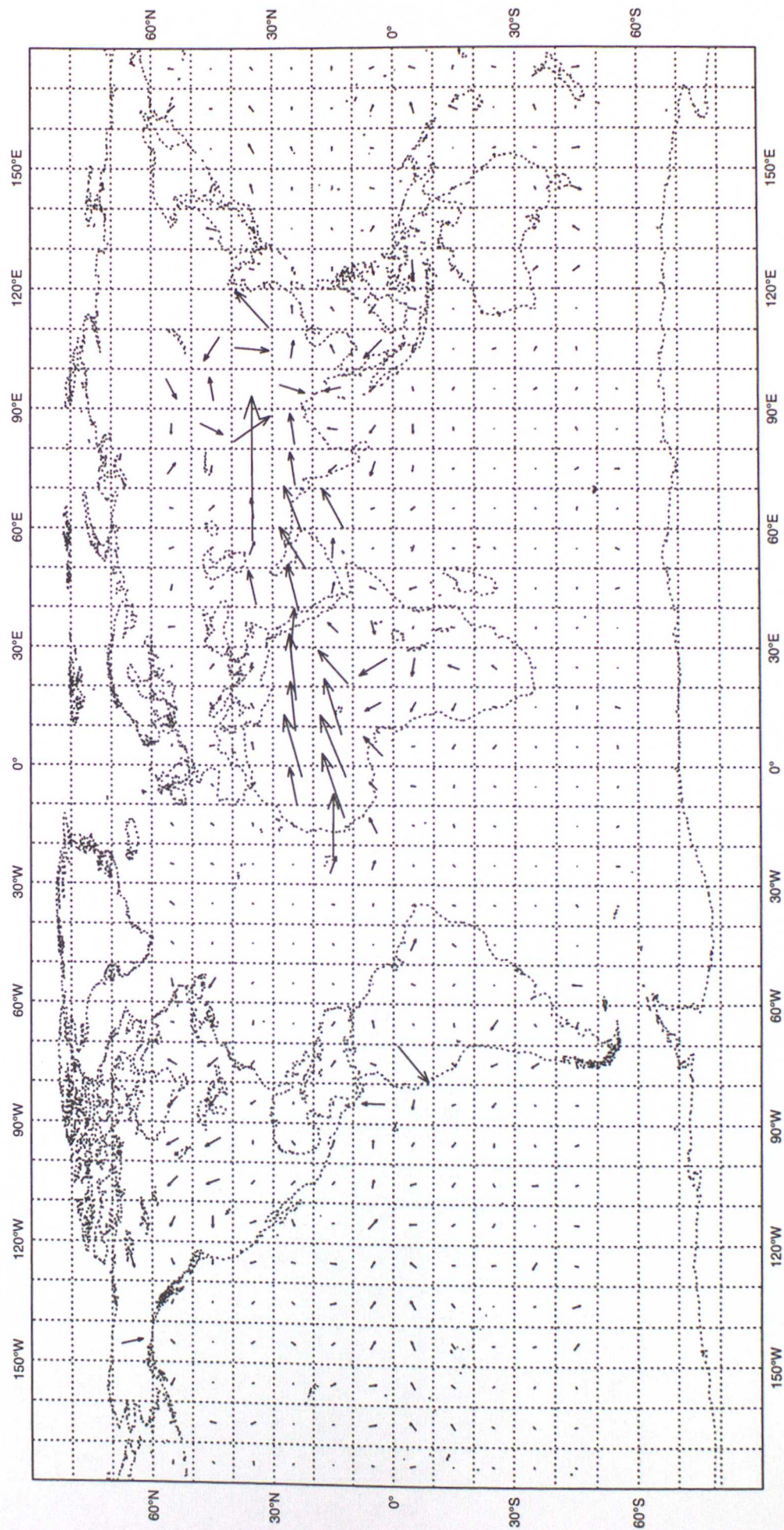


Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. MARCH 2004
 All observations
 Arrows are plotted where greater than 10 obs are present



10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). MARCH 2004

All observations

Values are plotted where greater than 10 obs are present

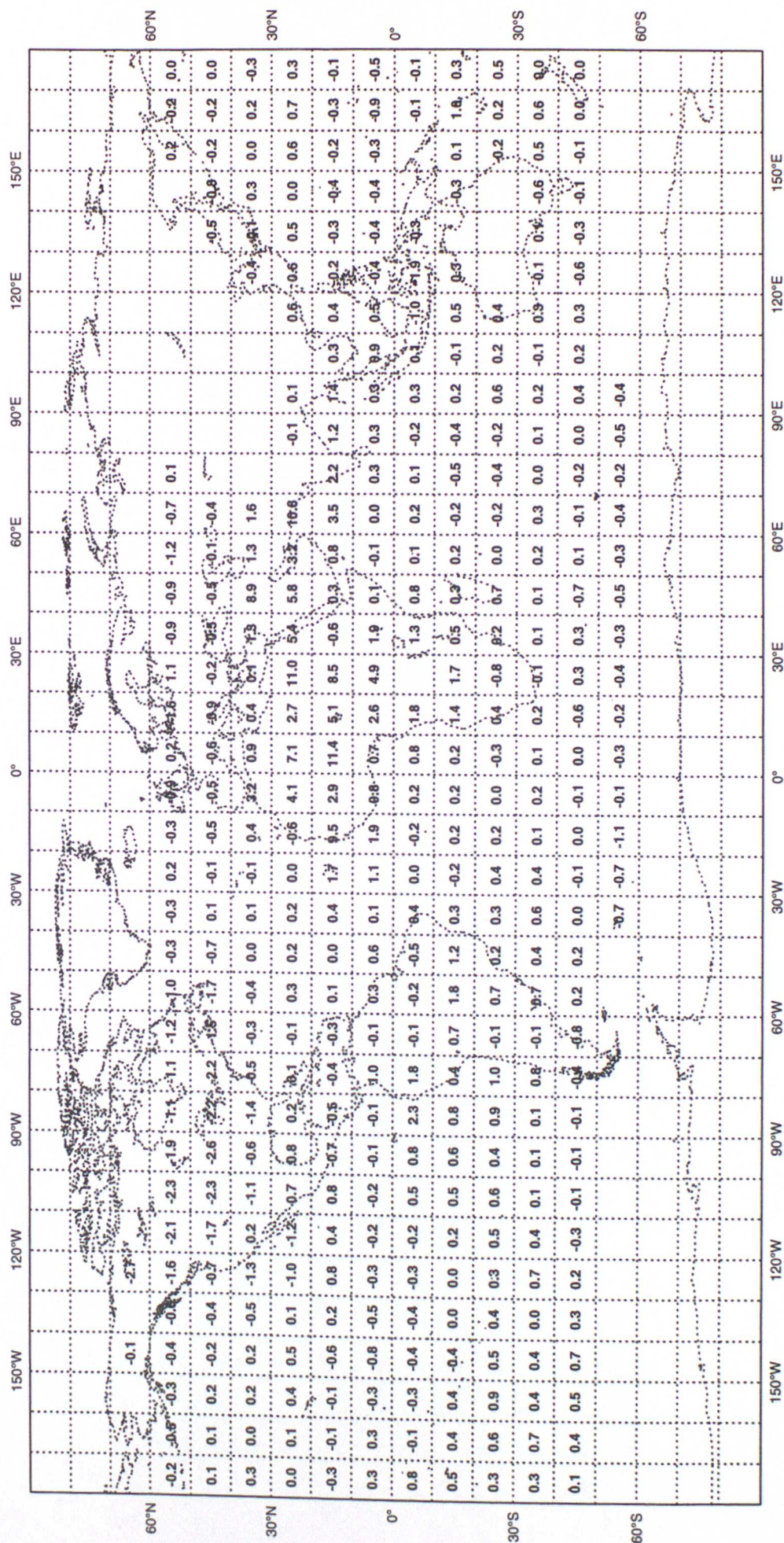
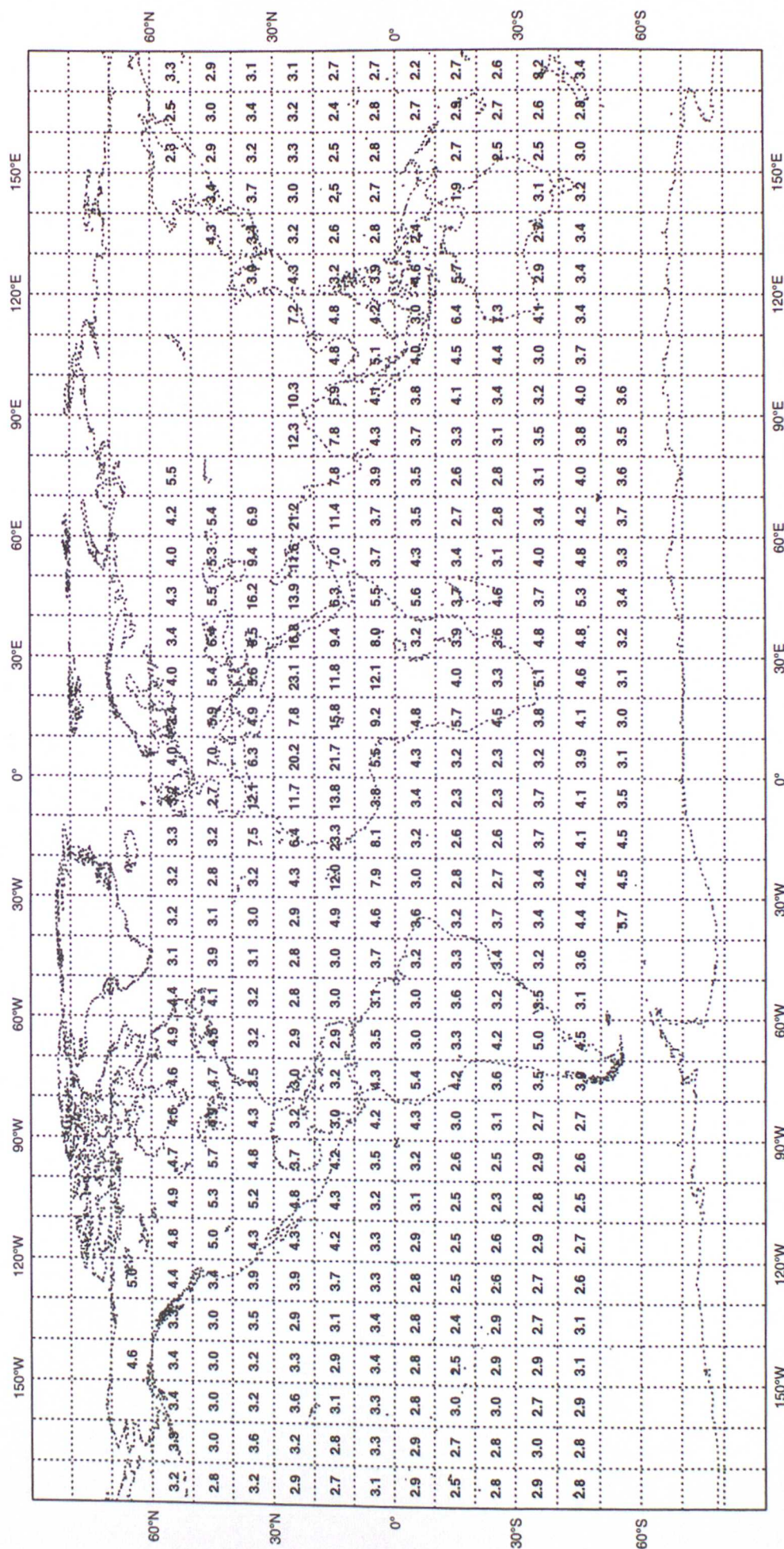


Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). MARCH 2004

All observations

Values are plotted where greater than 10 obs are present



Global average number of observations in 24 hours = 15501

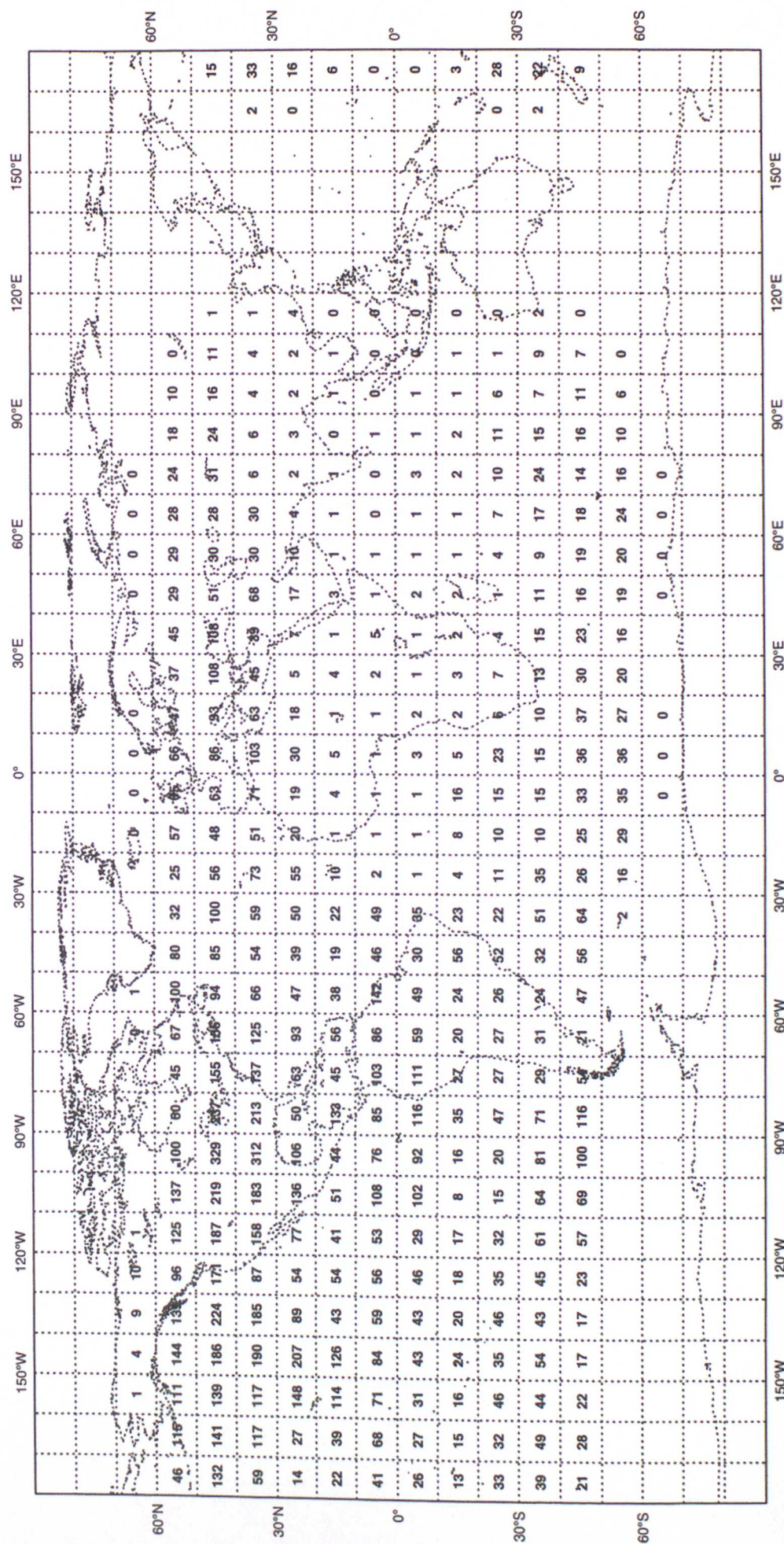
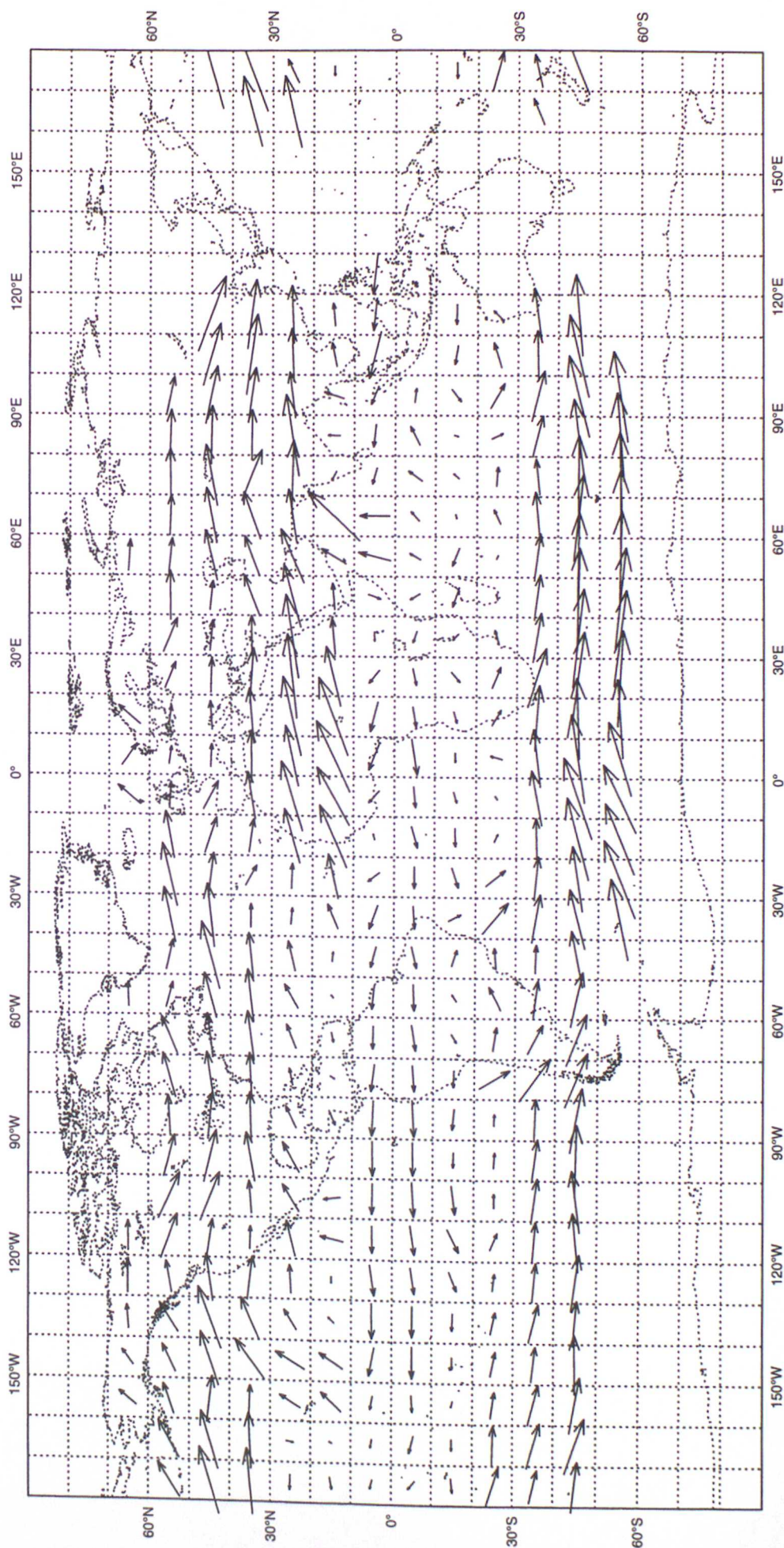


Figure 16. SATOB 401 - 700 hPa vector mean wind. MARCH 2004

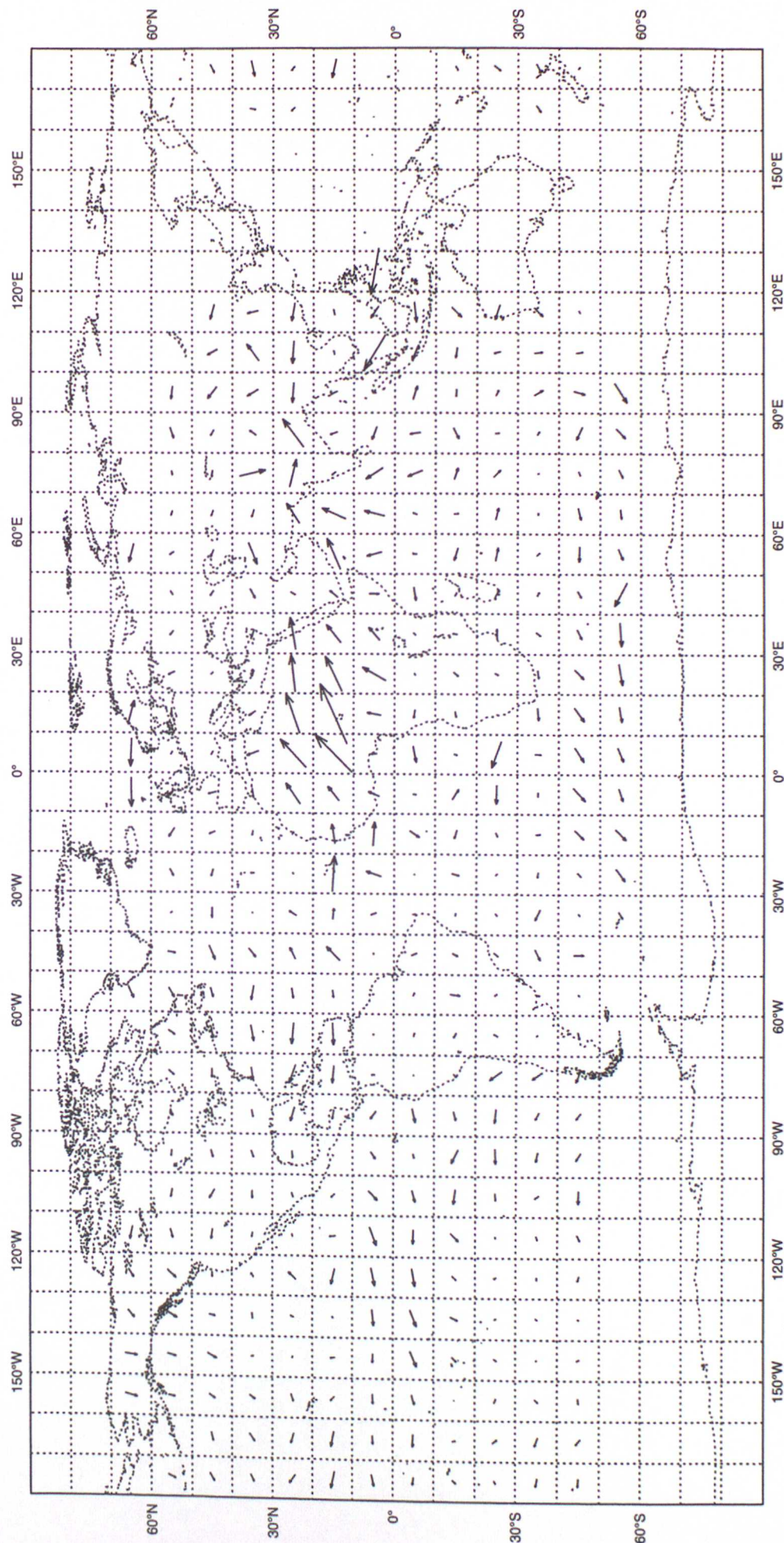
All observations

Arrows are plotted where greater than 10 obs are present



15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. MARCH 2004
All observations
Arrows are plotted where greater than 10 obs are present



10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). MARCH 2004
 All observations
 Values are plotted where greater than 10 obs are present

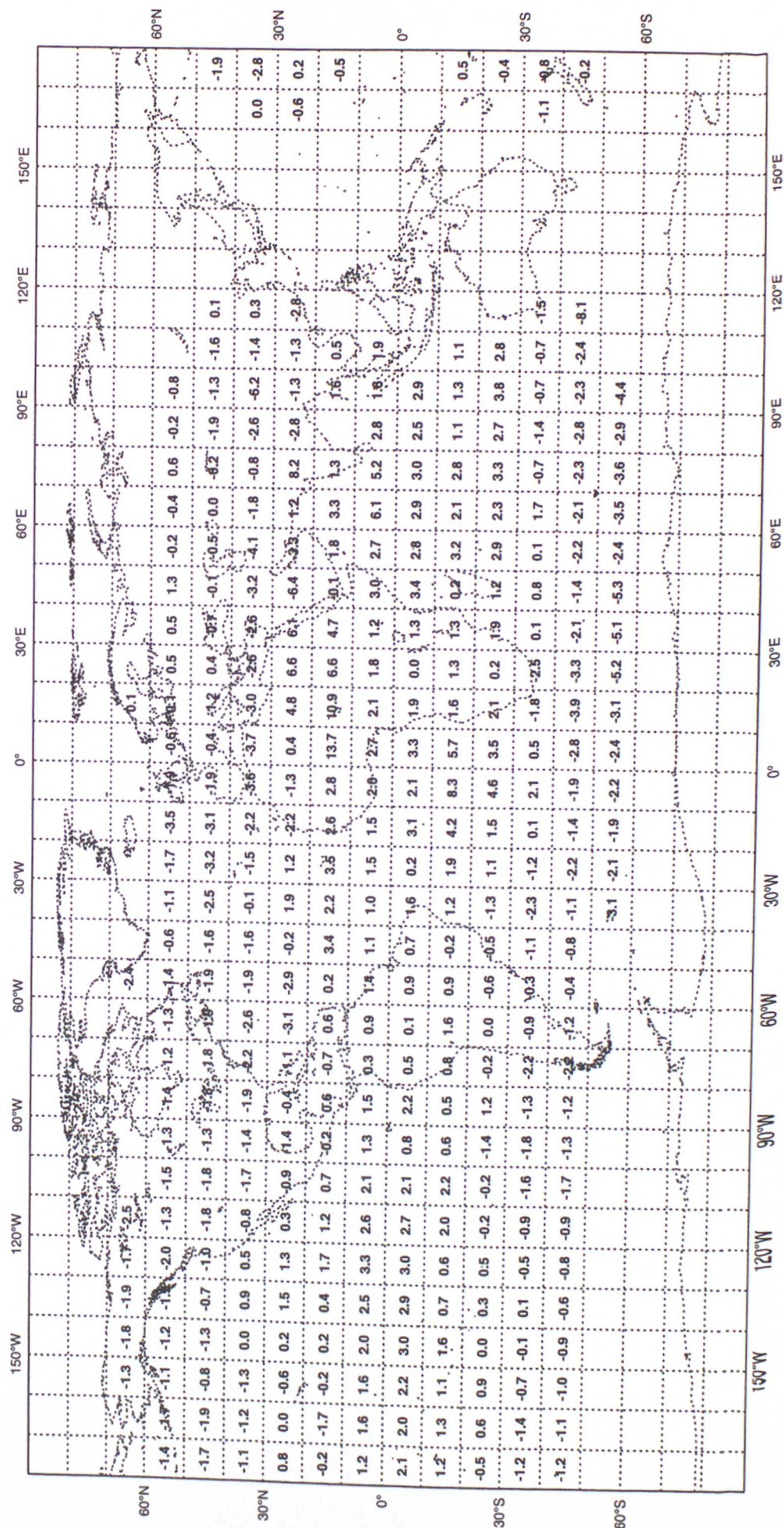


Figure 20. SATOB 101 - 400 hPa mean daily count. MARCH 2004
Global average number of observations in 24 hours = 203744

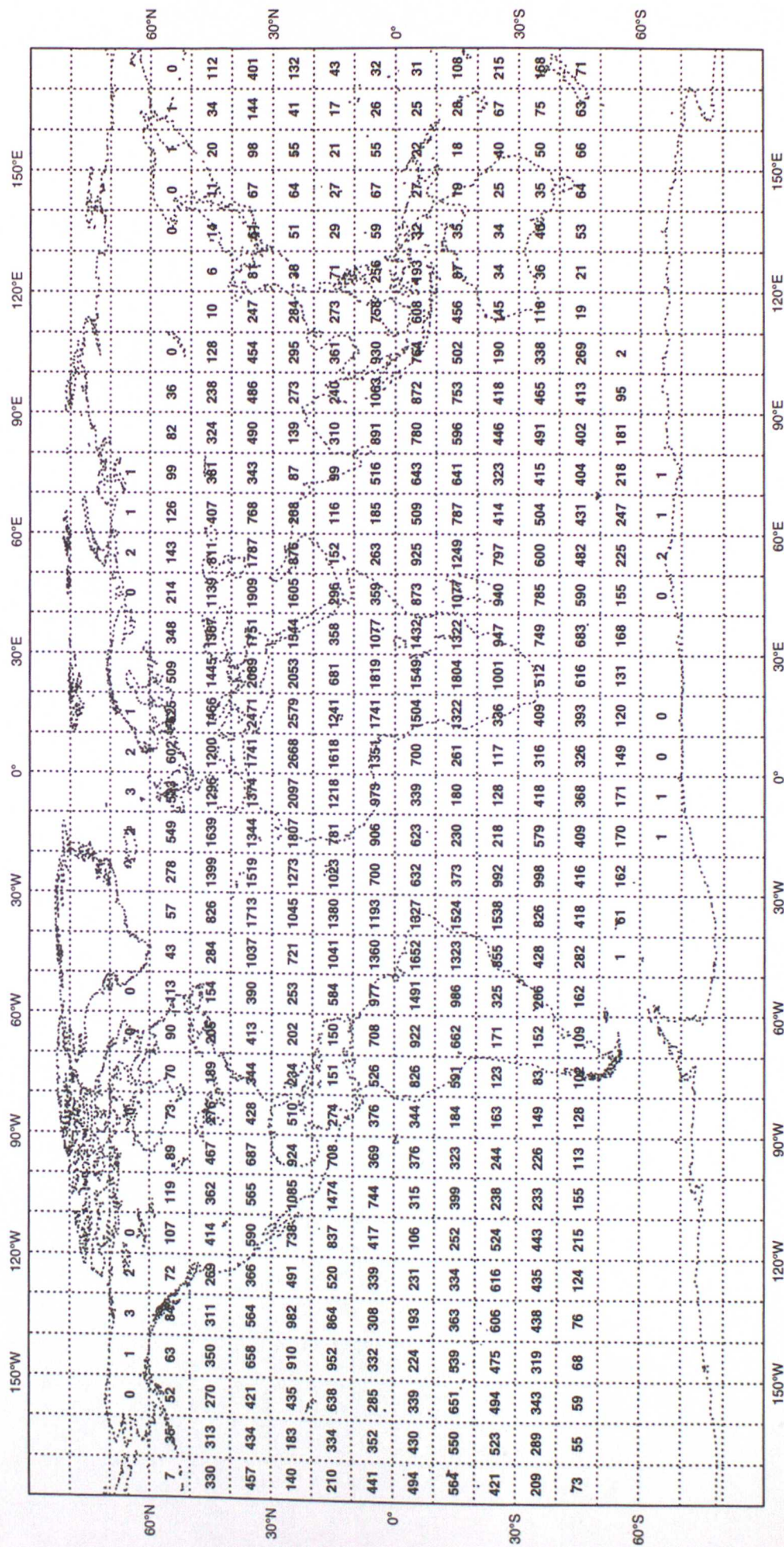


Figure 21. SATOB 101 - 400 hPa vector mean wind. MARCH 2004

All observations

Arrows are plotted where greater than 10 obs are present

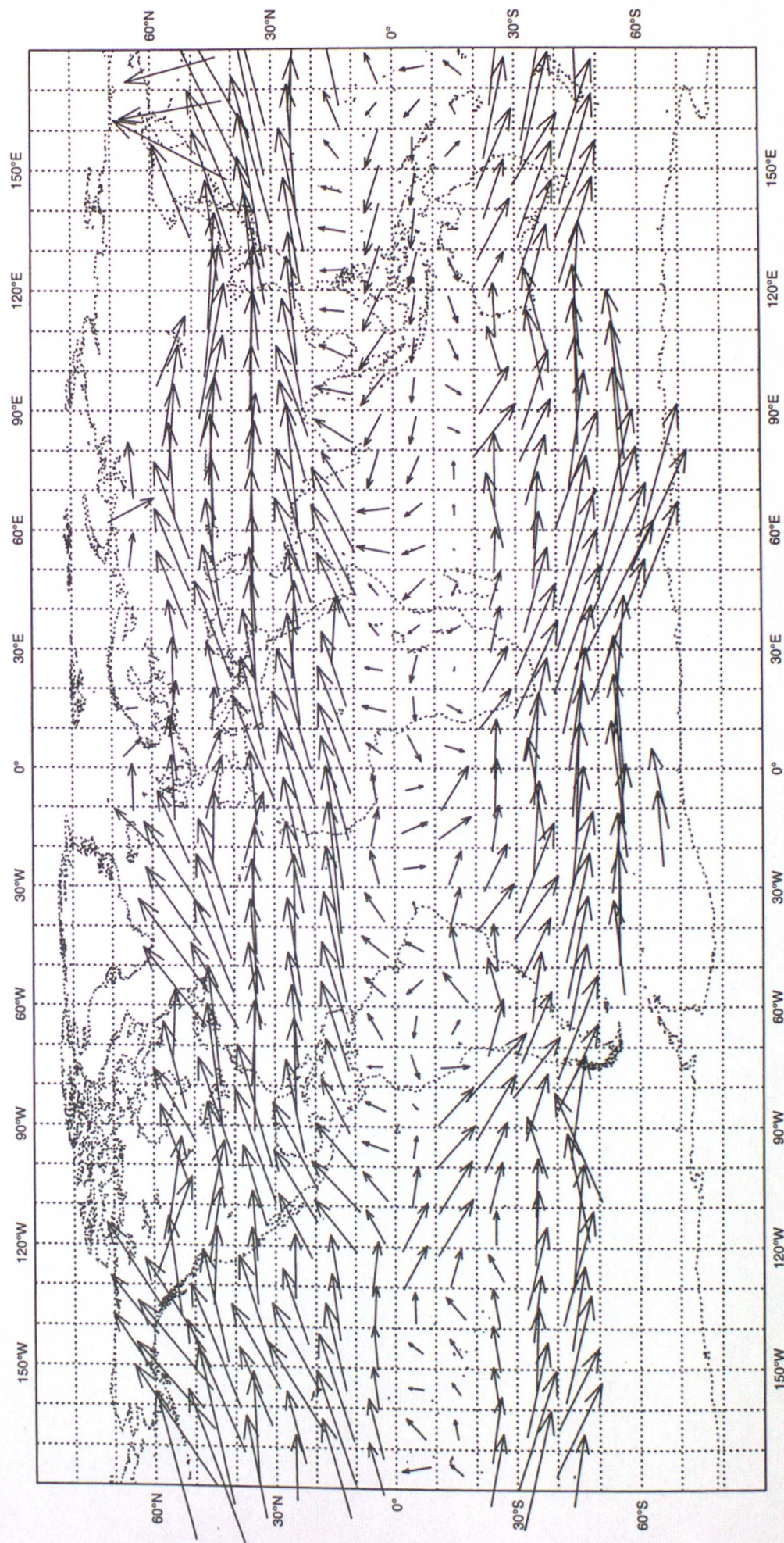
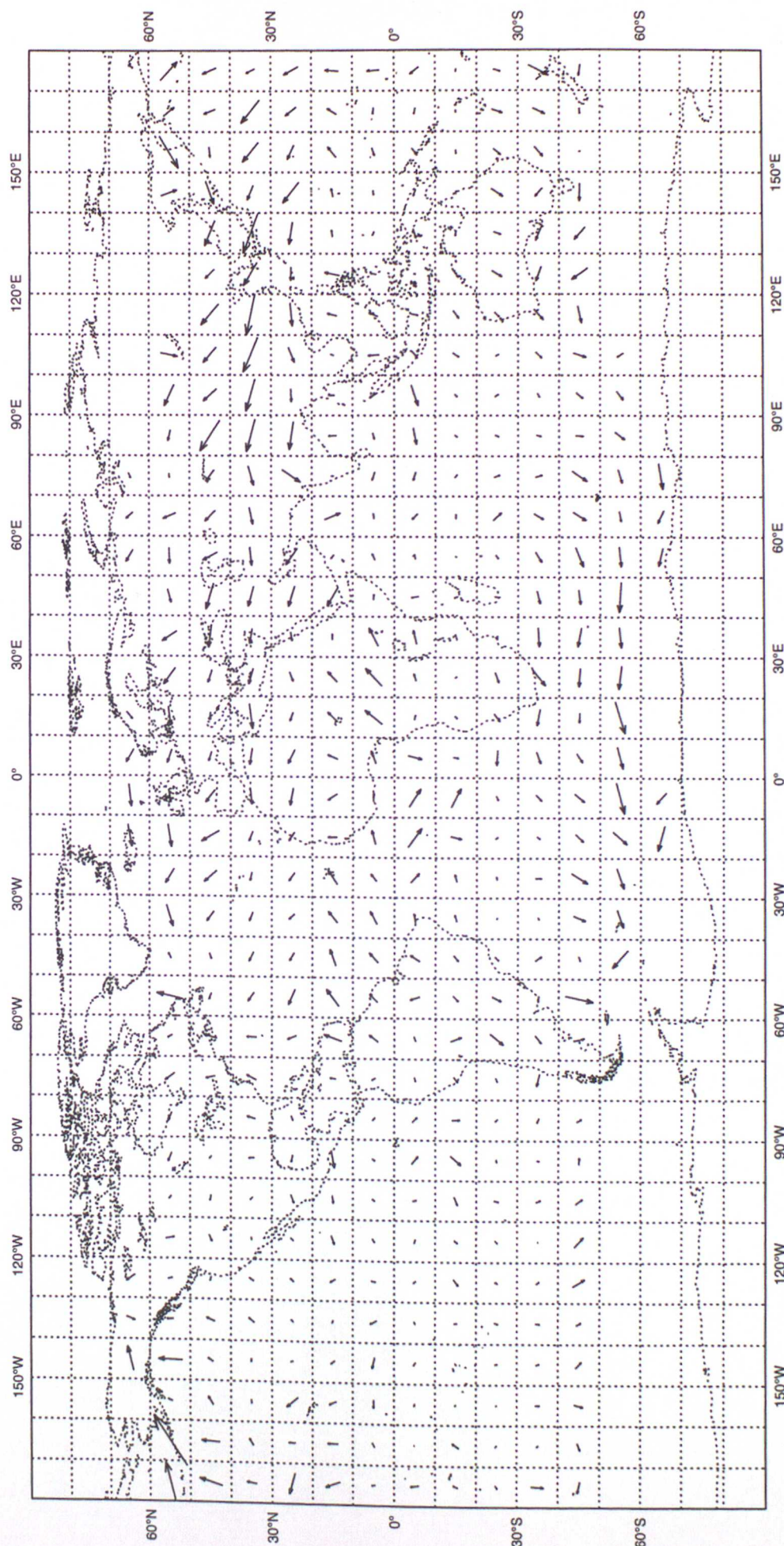


Figure 22. SATOB 101 - 400 hPa mean vector wind differences. MARCH 2004

All observations

Arrows are plotted where greater than 10 obs are present



10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). MARCH 2004
 All observations
 Values are plotted where greater than 10 obs are present

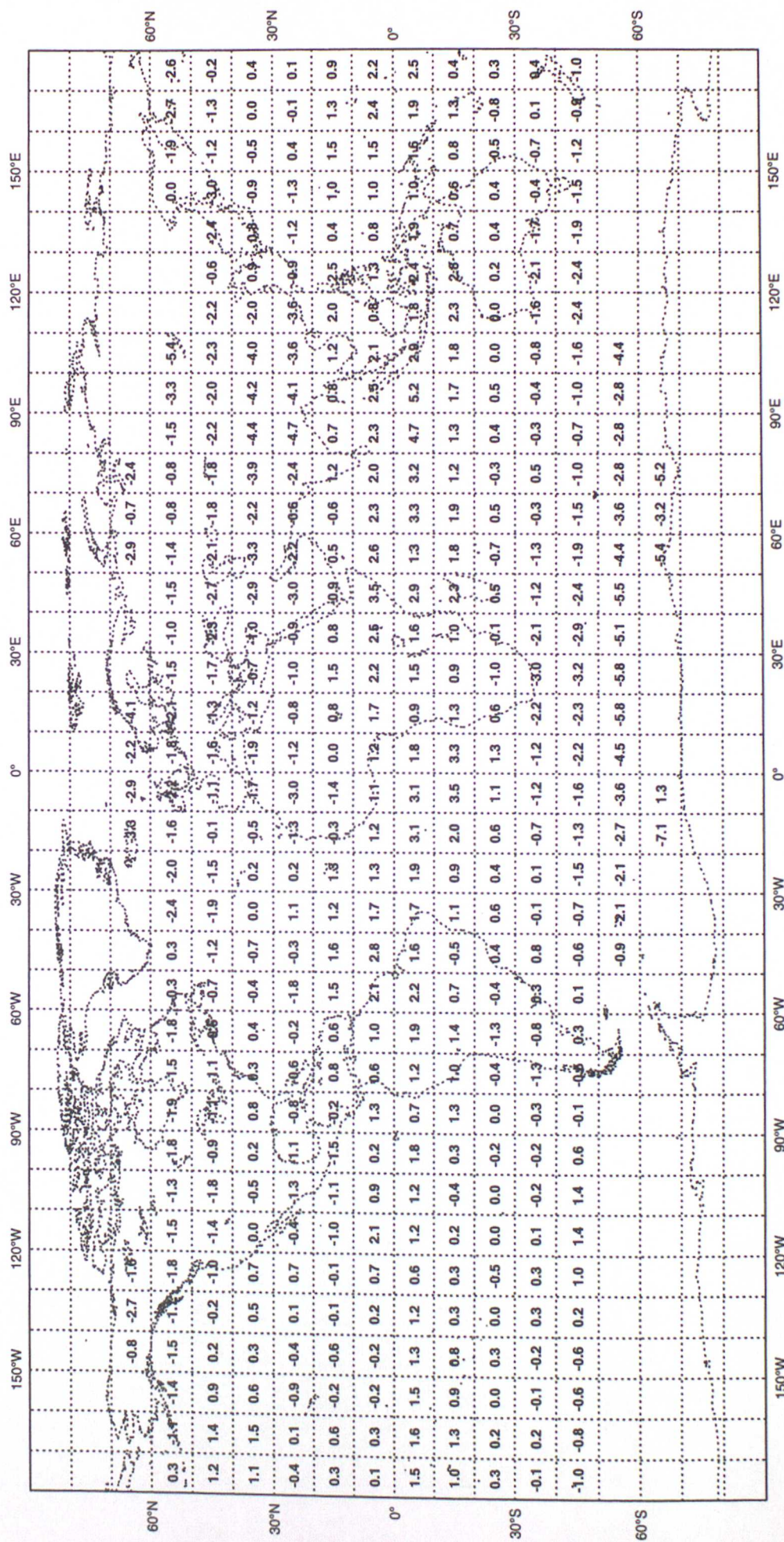
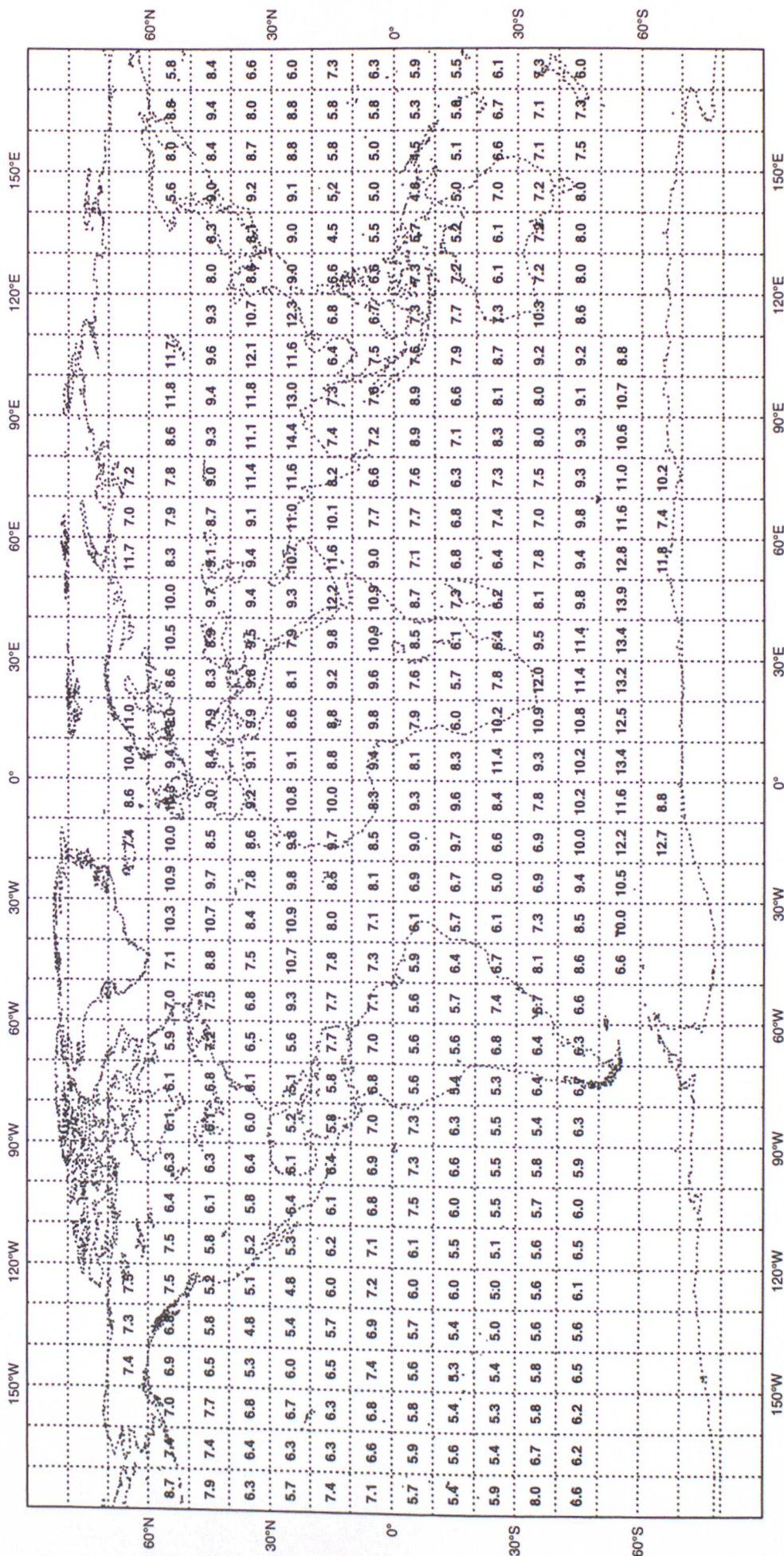


Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). MARCH 2004
 All observations
 Values are plotted where greater than 10 obs are present



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: EXETER

MONTH: Mar 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100) :Mean and standard deviation observation-minus-background brightness temperature differences

Global average number of observations in 24 hours = 619630

	150°W	120°W	90°W	60°W	30°W	0°	30°E	60°E	90°E	120°E	150°E																									
60°N	487	494	505	506	512	510	512	487	372	295	389	471	473	433	452	480	498	499	494	487	483	474	475	475	470	464	444	464	463	465	467	472	476	480	484	
	1293	1319	1346	1371	1390	1392	1395	1399	1406	1412	1231	1265	1495	1133	1184	1331	1397	1377	1347	1302	1290	1294	1275	1280	1288	315	1387	1213	1174	1265	1262	1286	1279	1274	1265	1267
	1040	1053	1053	1109	1142	1145	1168	1181	1208	1231	1233	1166	1227	1019	1104	1209	1187	1154	1098	1039	1020	1052	1076	1119	1162	1224	1247	1215	1192	1115	1134	1008	957	941	823	918
60°N	932	936	974	1058	1129	1155	1187	1197	1211	1203	1213	1183	1174	1143	1135	1121	1091	1065	1004	974	958	958	1023	1095	1130	1181	1212	1195	1214	1173	1143	1067	1033	999	969	939
	869	855	865	1010	1103	1137	1177	1198	1198	1196	1187	1166	1167	1107	1100	1070	1043	1013	969	974	935	931	1034	1111	1165	1201	1145	1044	1158	1184	1175	1090	1008	953	925	867
	916	954	997	1054	1068	1067	1131	1179	1175	1184	1174	1180	1191	1129	1092	1054	1005	967	941	965	943	916	1032	1088	1150	1195	1170	1192	1186	1180	1190	1119	1016	950	952	897
30°N																																				
	884	986	1058	1074	1098	1099	1128	1189	1152	1163	1162	1141	1159	1094	1040	1026	1006	930	943	866	875	894	1044	1085	1149	1197	1160	1191	1175	1173	1185	1011	935	899	939	913
	814	865	972	969	1045	1076	1116	1175	1136	1179	1136	1112	1100	993	958	938	979	892	932	926	864	965	998	1044	1128	1180	1080	1074	1077	1107	1009	847	845	830	879	908
	637	717	839	946	1048	1113	1118	1153	1127	1142	833	856	863	571	703	893	938	852	894	714	569	817	981	1064	1149	1031	788	844	905	852	709	590	377	404	578	733
0°																																				
	571	633	791	922	1008	1037	1102	1147	1115	1107	612	529	612	916	913	903	932	851	864	397	436	851	937	907	918	933	691	574	408	376	873	403	327	241	298	433
	467	679	728	906	991	1115	1157	1160	1170	1152	913	899	1022	990	933	962	939	895	903	548	547	807	794	751	851	1020	1005	814	849	736	582	612	650	511	509	539
	710	705	899	998	989	1097	1169	1157	1192	1154	1129	1158	1069	1088	1005	957	891	895	906	826	913	996	926	867	1063	1125	1169	1040	1054	1958	959	1020	1057	854	638	730
30°S																																				
	892	842	911	1005	1037	1095	1173	1169	1204	1173	1184	1192	1130	1105	1054	991	926	943	915	902	1017	1064	1086	1114	1140	1146	1161	1157	1171	1178	1154	1120	1067	995	908	882
	959	945	963	1017	1067	1112	1155	1190	1205	1187	1185	1198	1166	1136	1084	997	945	957	924	953	1047	1071	1099	1121	1159	1189	1184	1189	1200	1193	1201	1190	1145	1093	1000	937
	984	982	977	1021	1085	1150	1195	1216	1227	1226	1229	1217	1185	1150	1082	1011	969	962	969	1019	1089	1127	1142	1170	1198	1211	1219	1221	1223	1216	1215	1192	1159	1123	1052	996
60°S																																				
	1084	1050	1041	1069	1126	1182	1231	1256	1276	1291	1292	1294	1236	1187	1131	1084	1064	1055	1081	1121	1173	1209	1214	1209	1255	1230	1266	1246	1218	1240	1233	1195	1193	1191	1166	1124
	1184	1182	1163	1305	1040	985	1024	1085	1032	1058	1046	1027	1177	1168	1214	1184	1145	992	790	739	762	711	590	899	1162	1085	785	328	507	503	543	905	916	1015	1195	1148
	305	326	295	274	319	321	271	214	230	389	428	402	363	363	405	379	335	259	206	201	221	178	104	58	49	53	59	68	116	175	263	292	304	324	376	313

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations

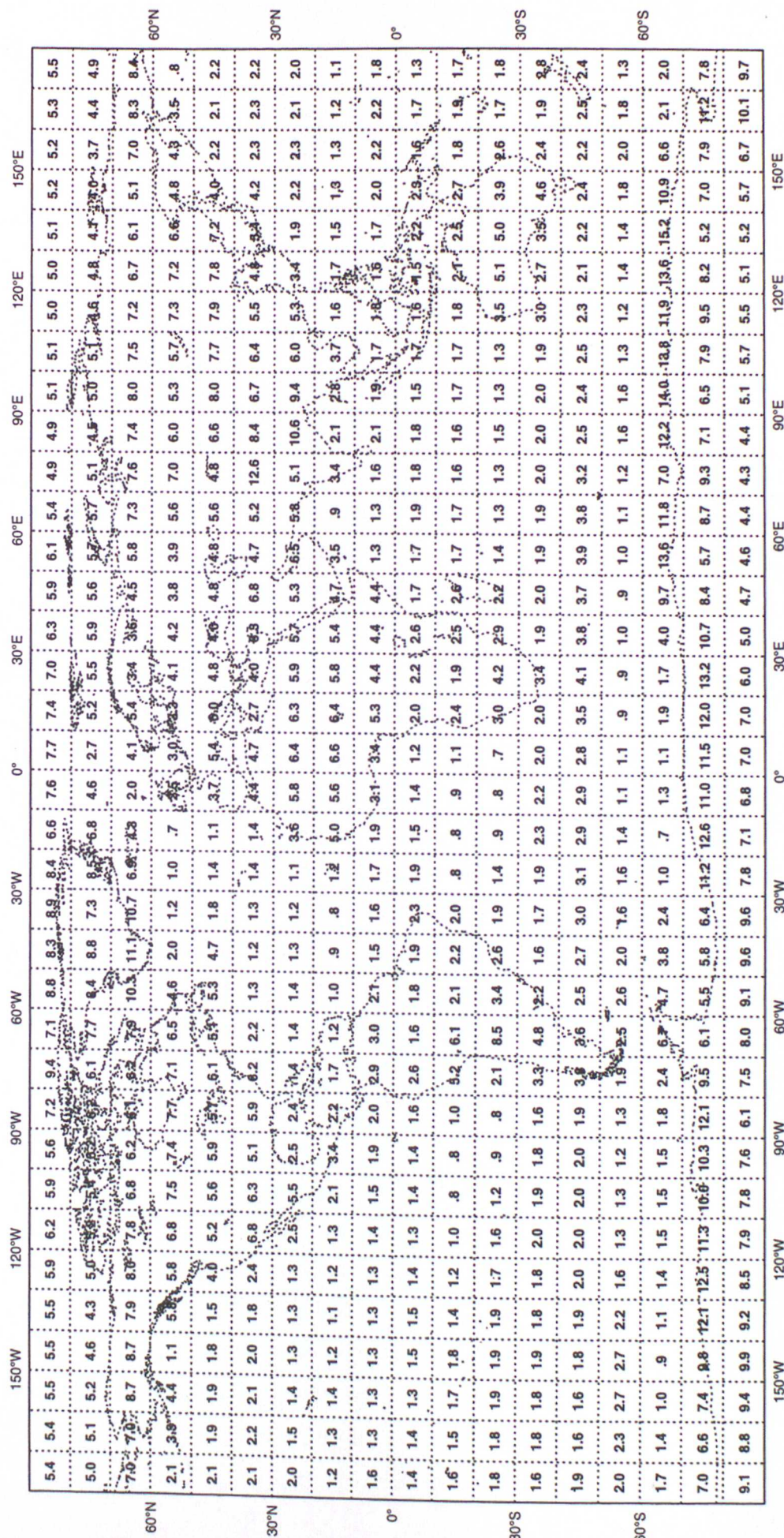


Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

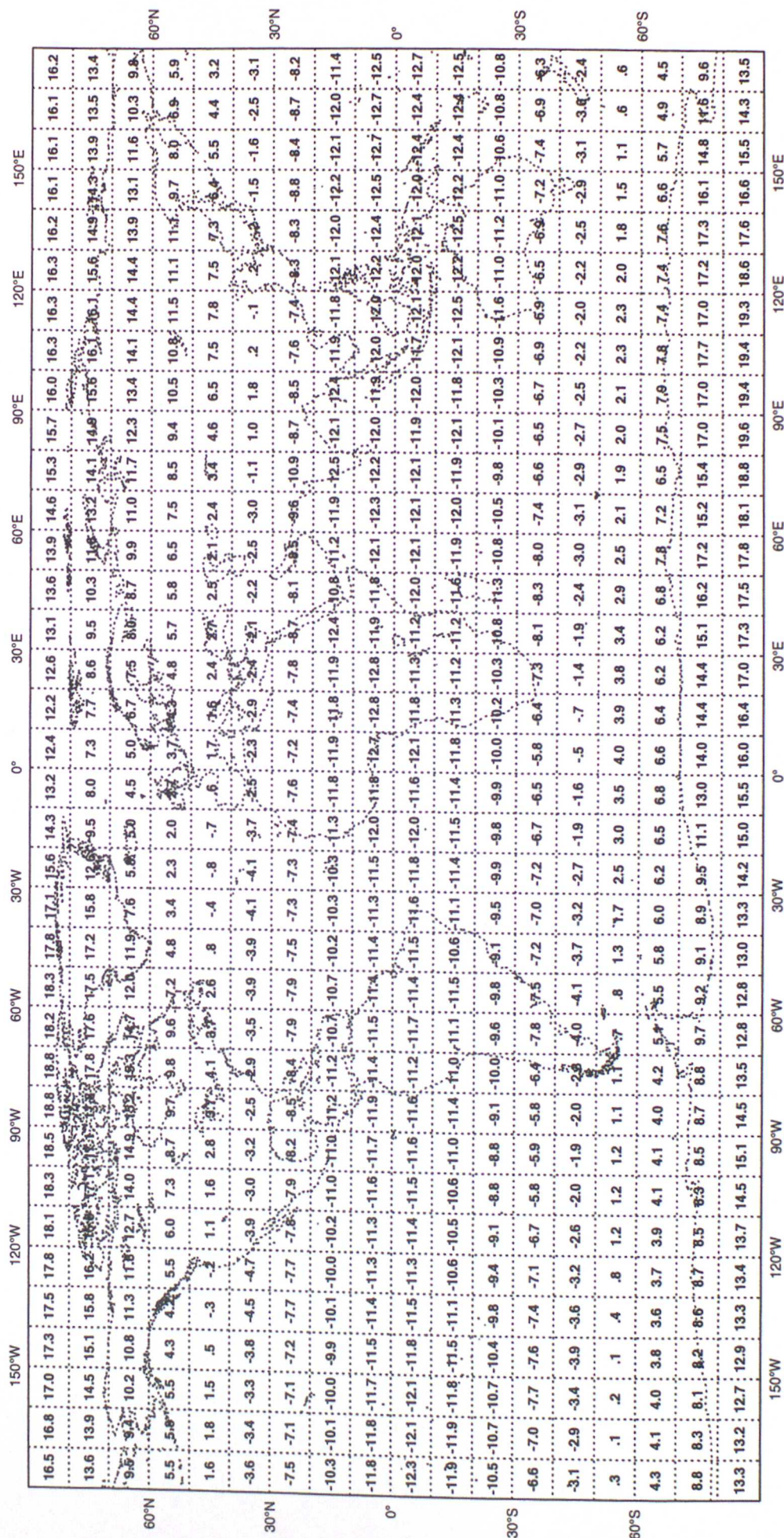


Figure 31. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

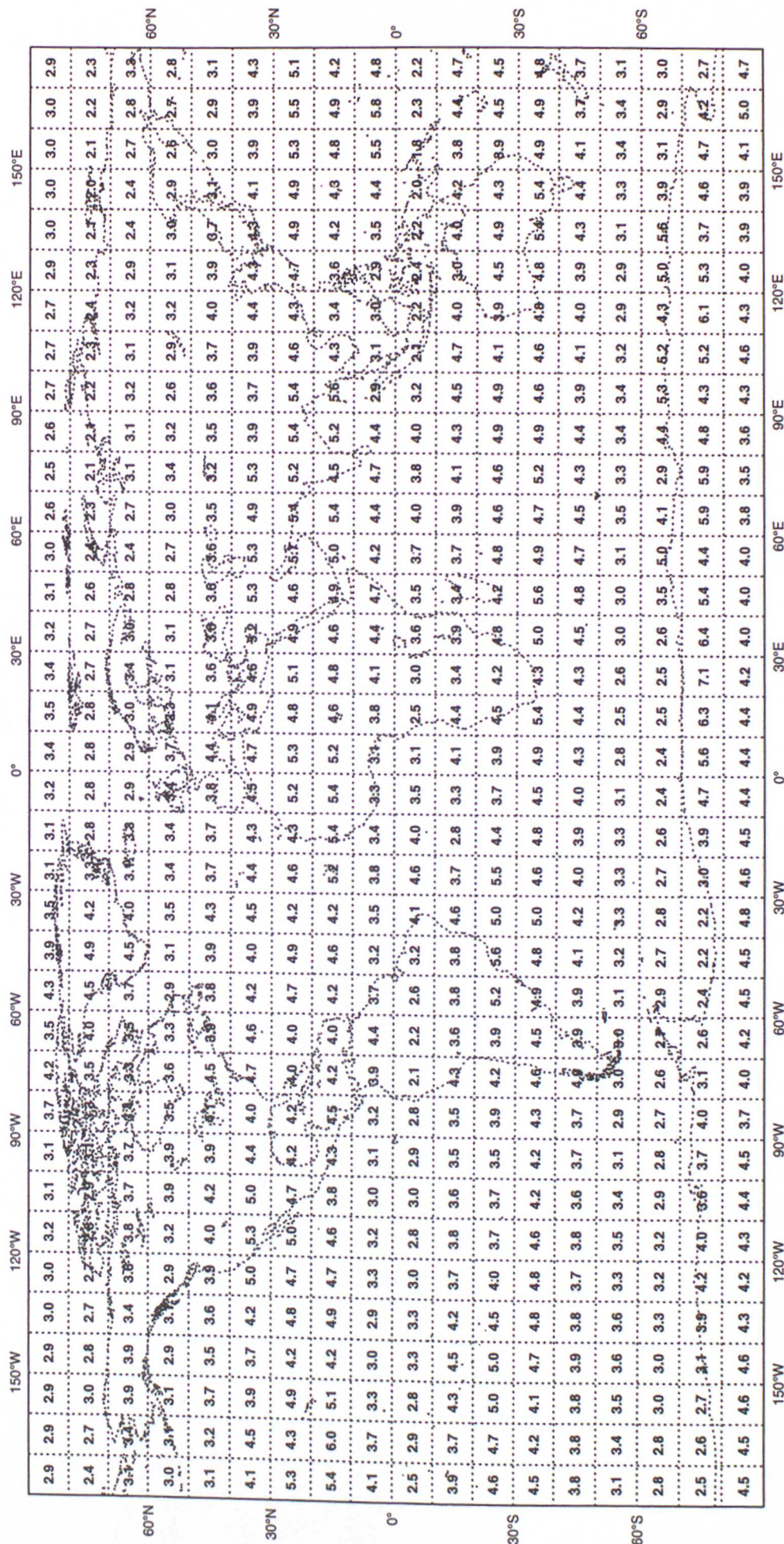


Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

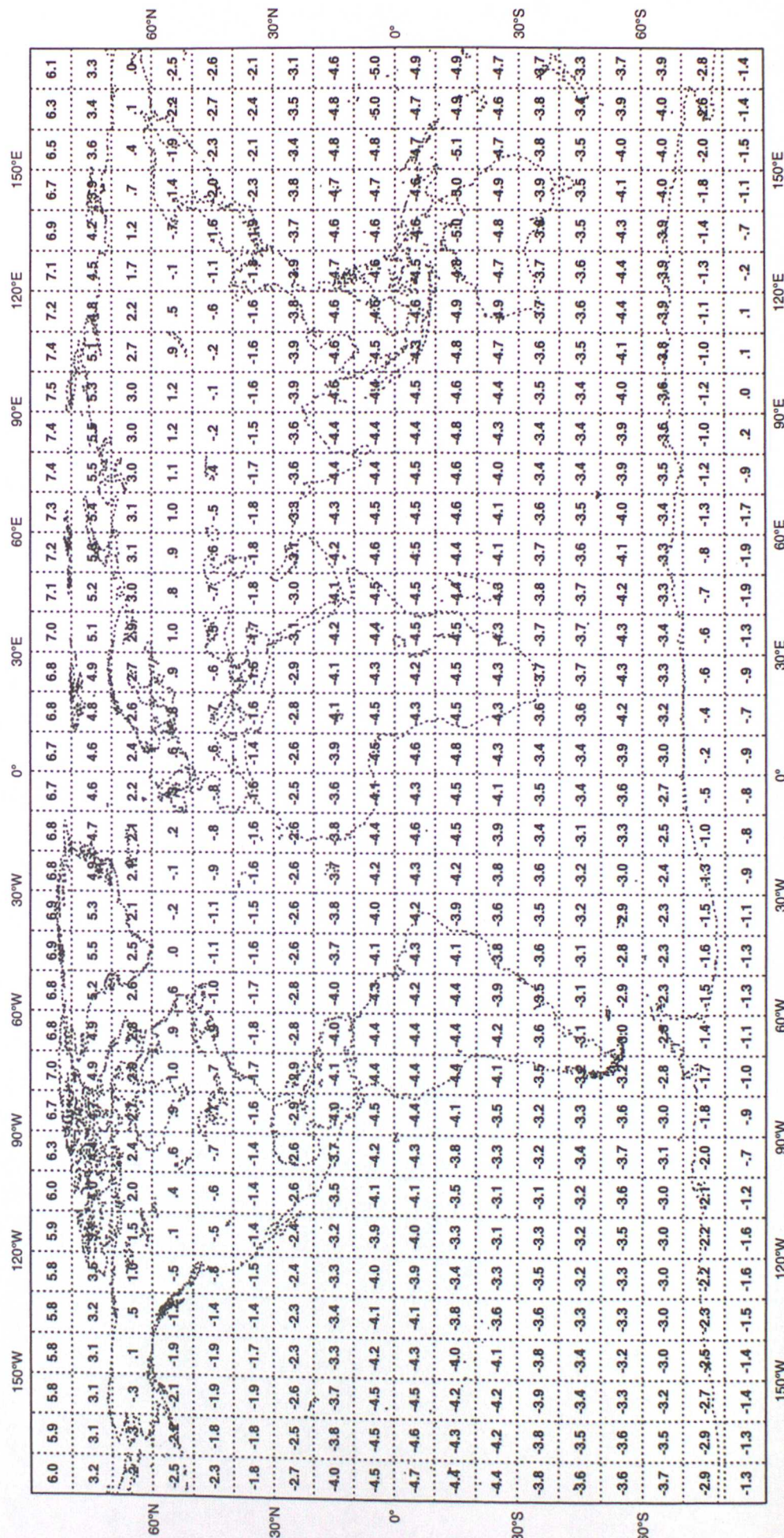


Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

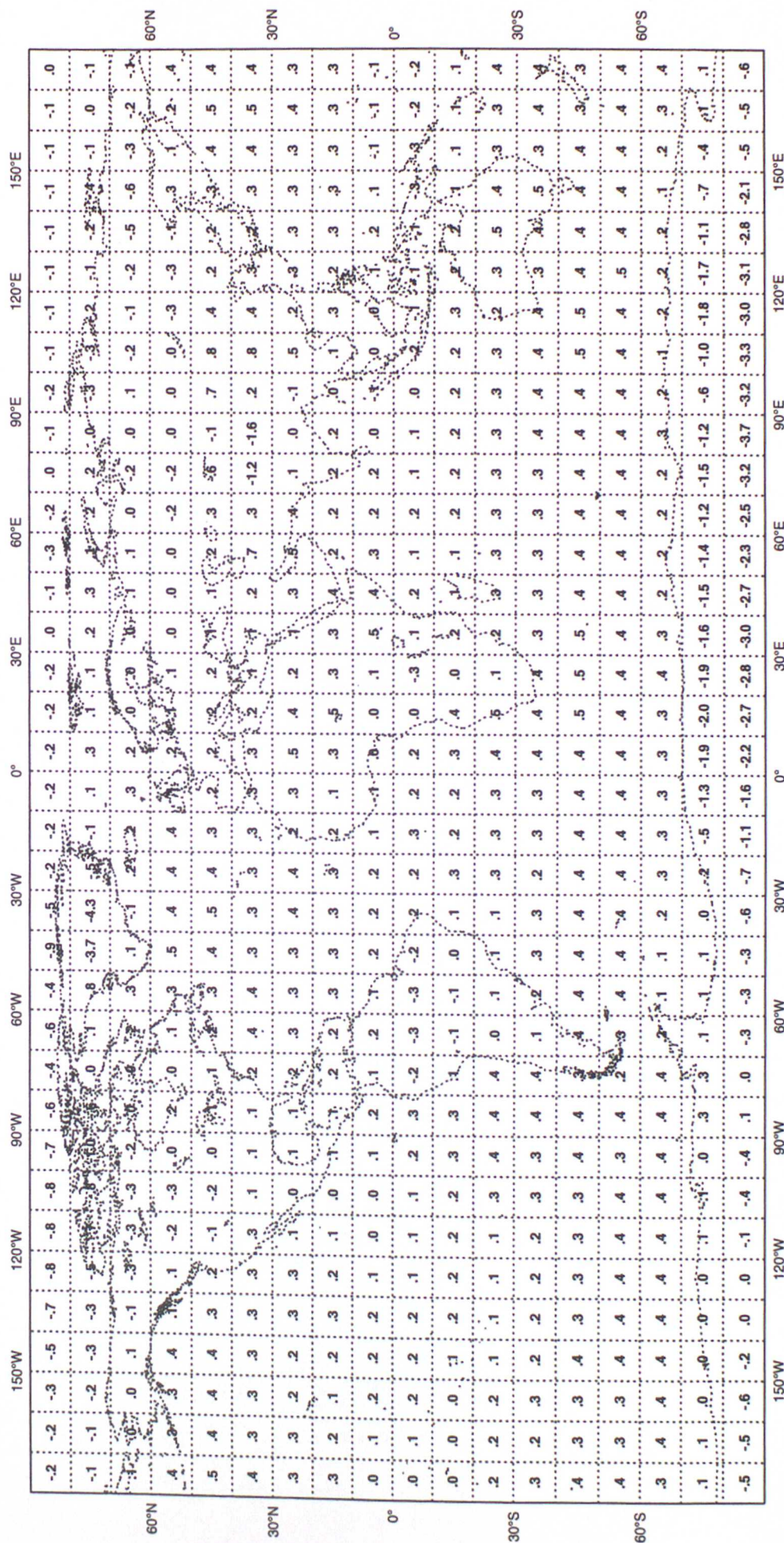


Figure 35. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

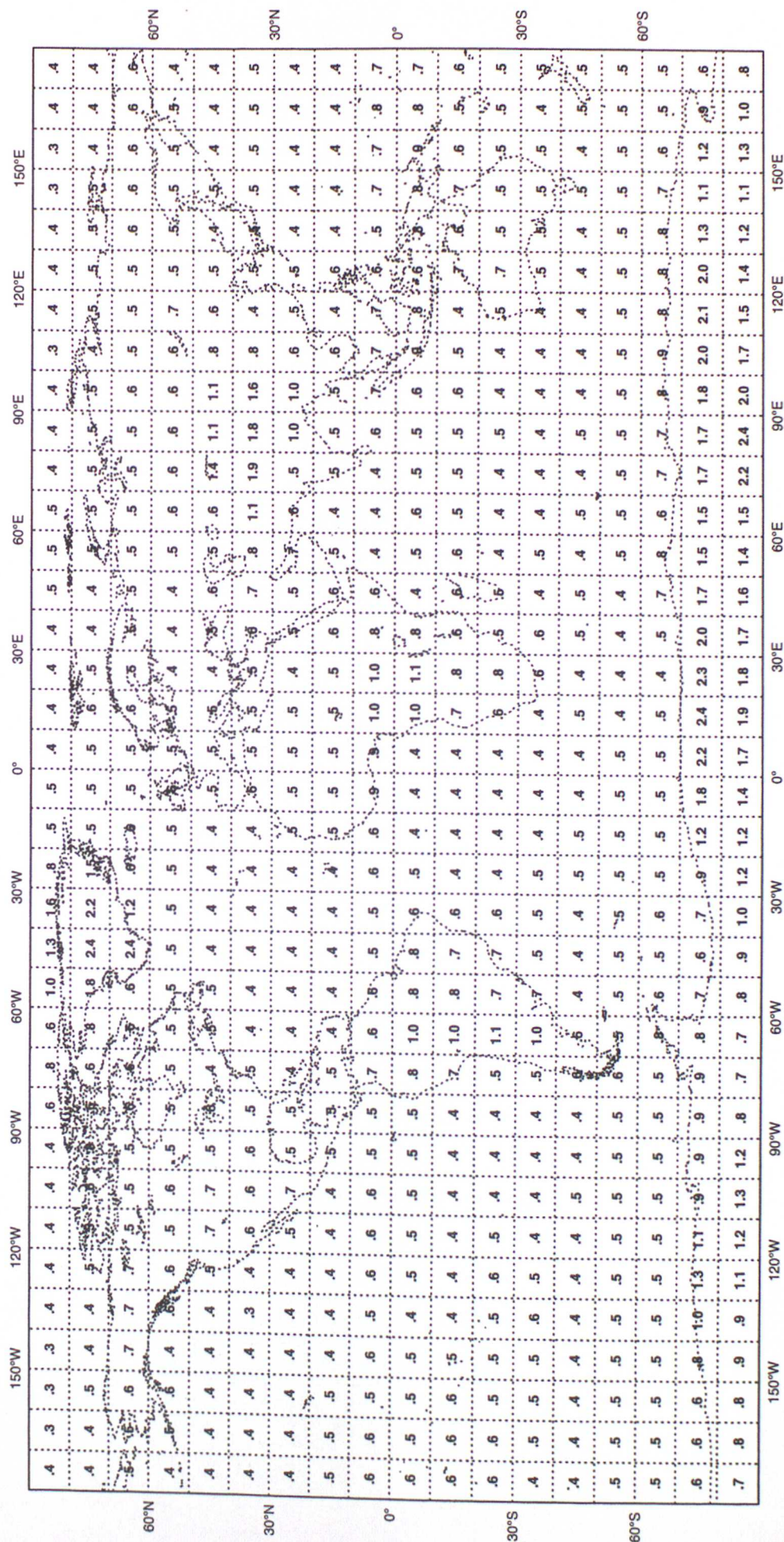


Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

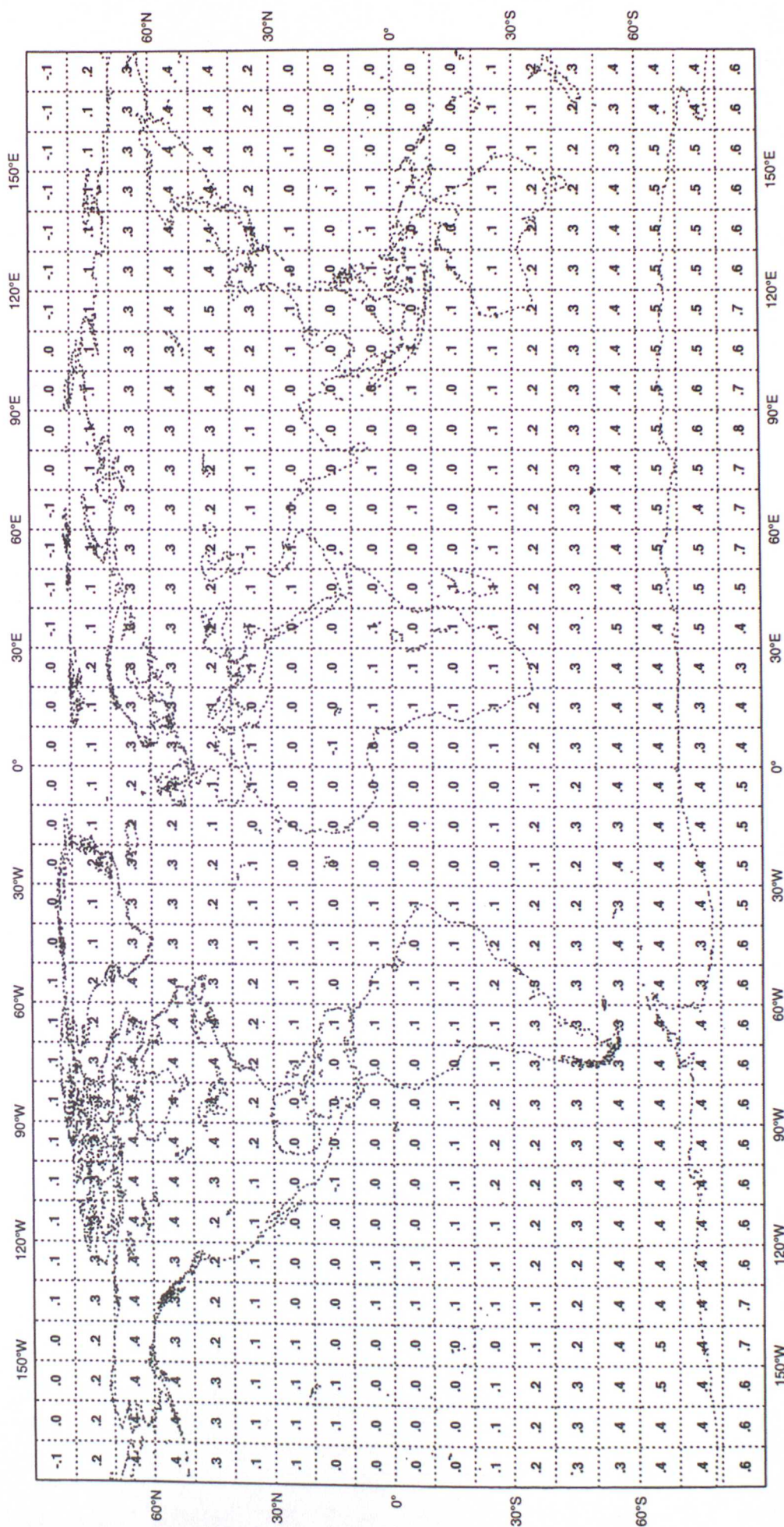


Figure 37. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

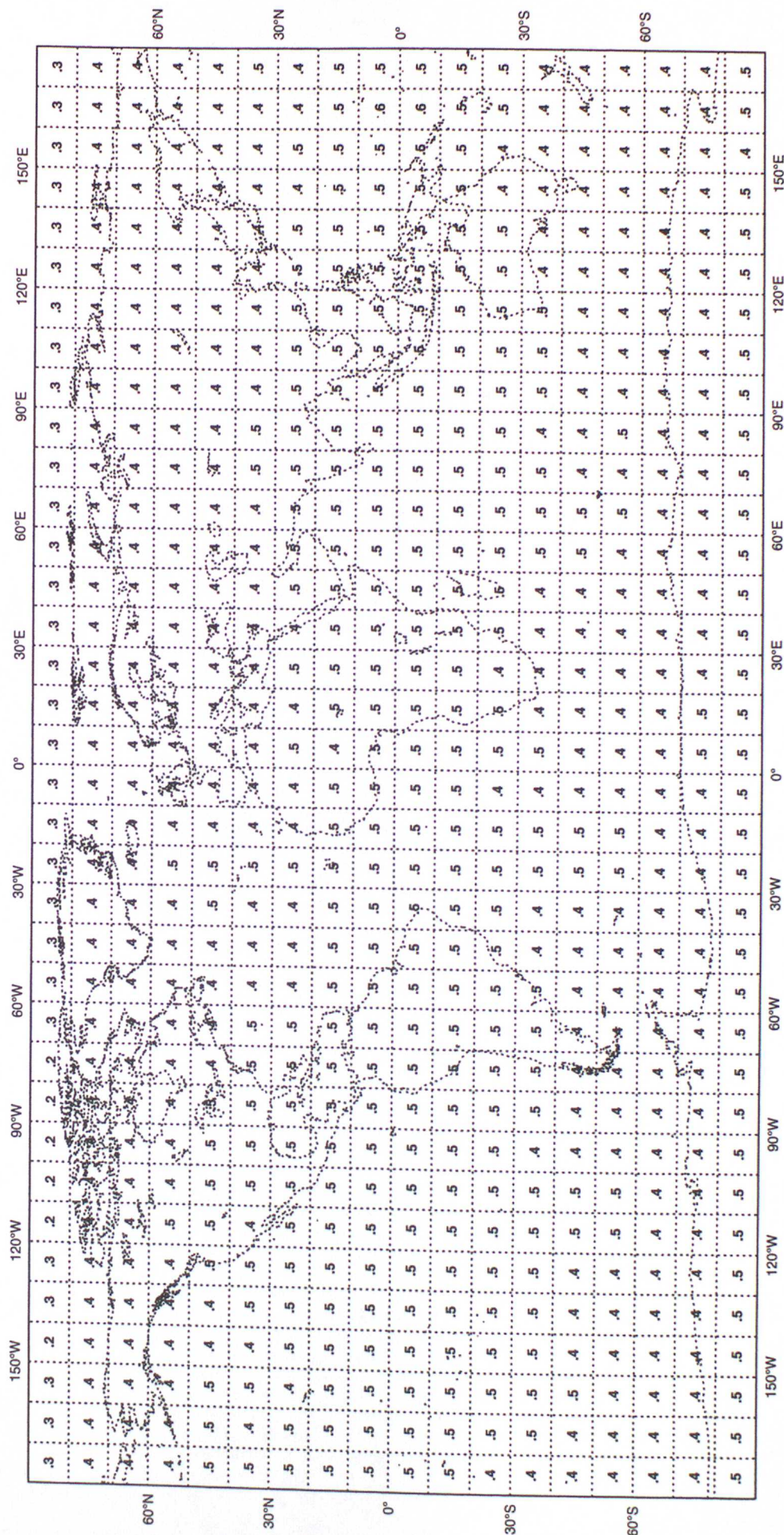


Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

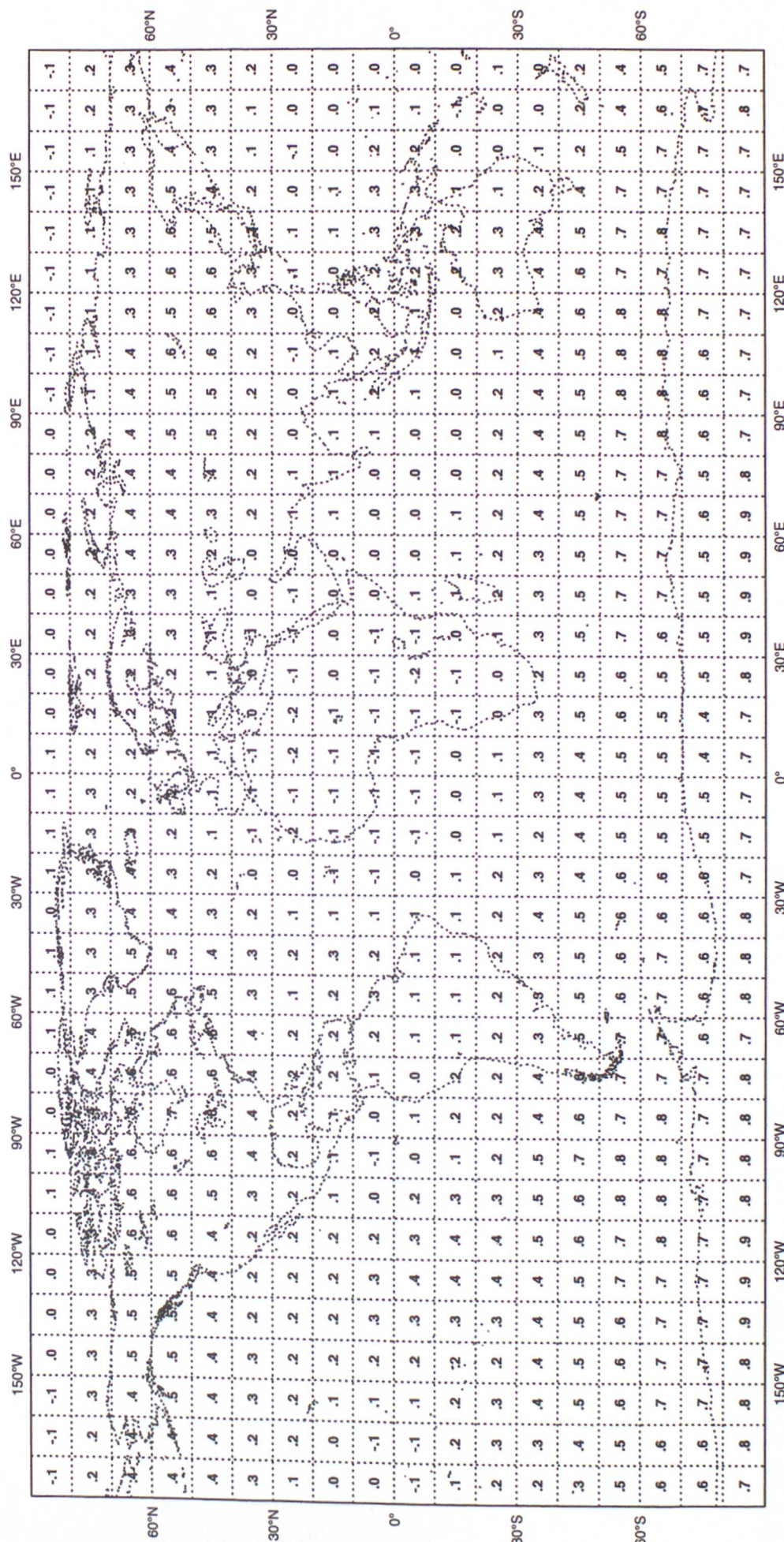


Figure 39. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004

Channel: AMSUA-9 (100 hPa)

NOAA15, using all observations

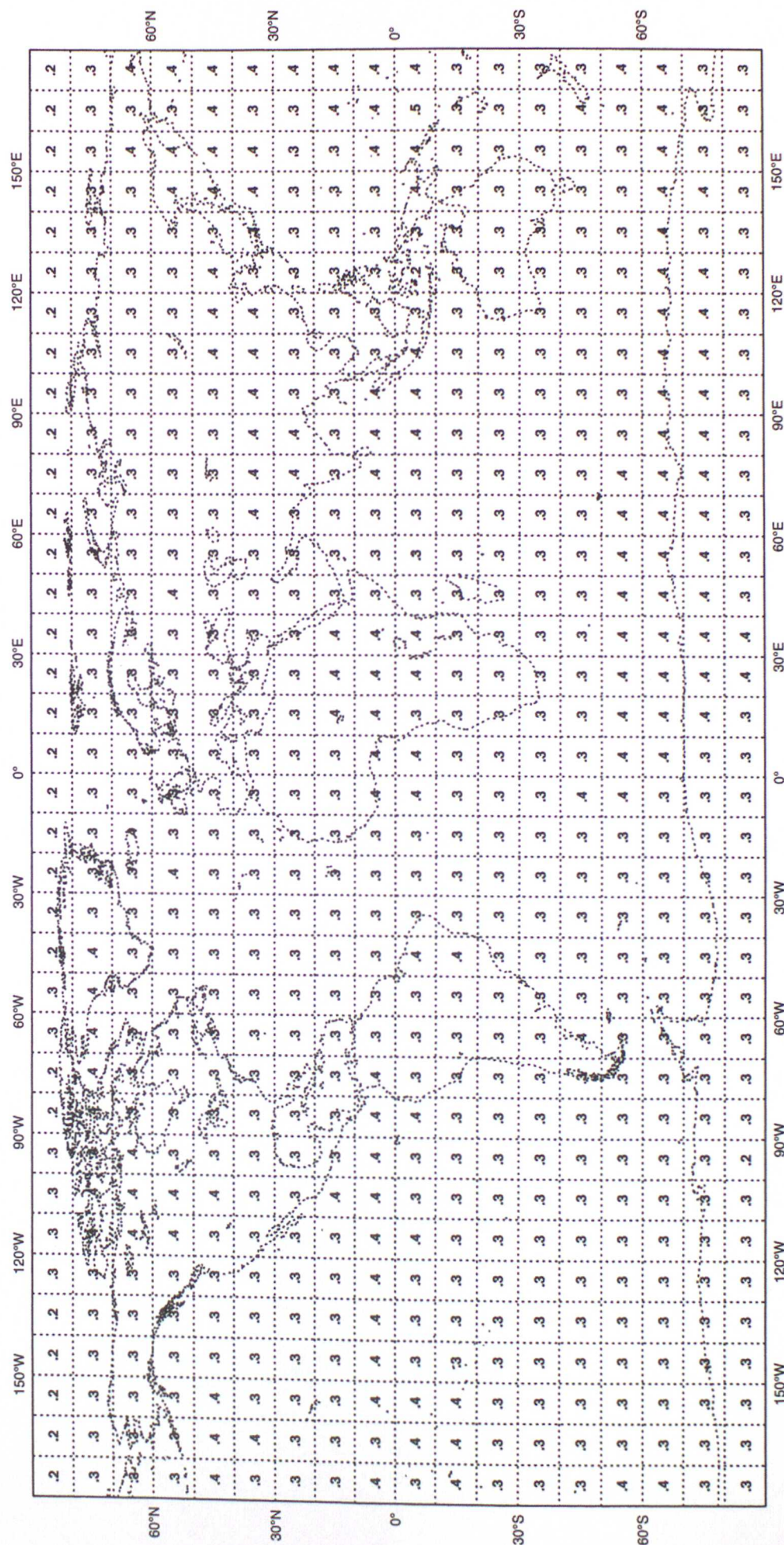


Figure 40. ATOVS mean daily count. MARCH 2004
 NOAA16, using all observations
 Global average number of observations in 24 hours = 537075

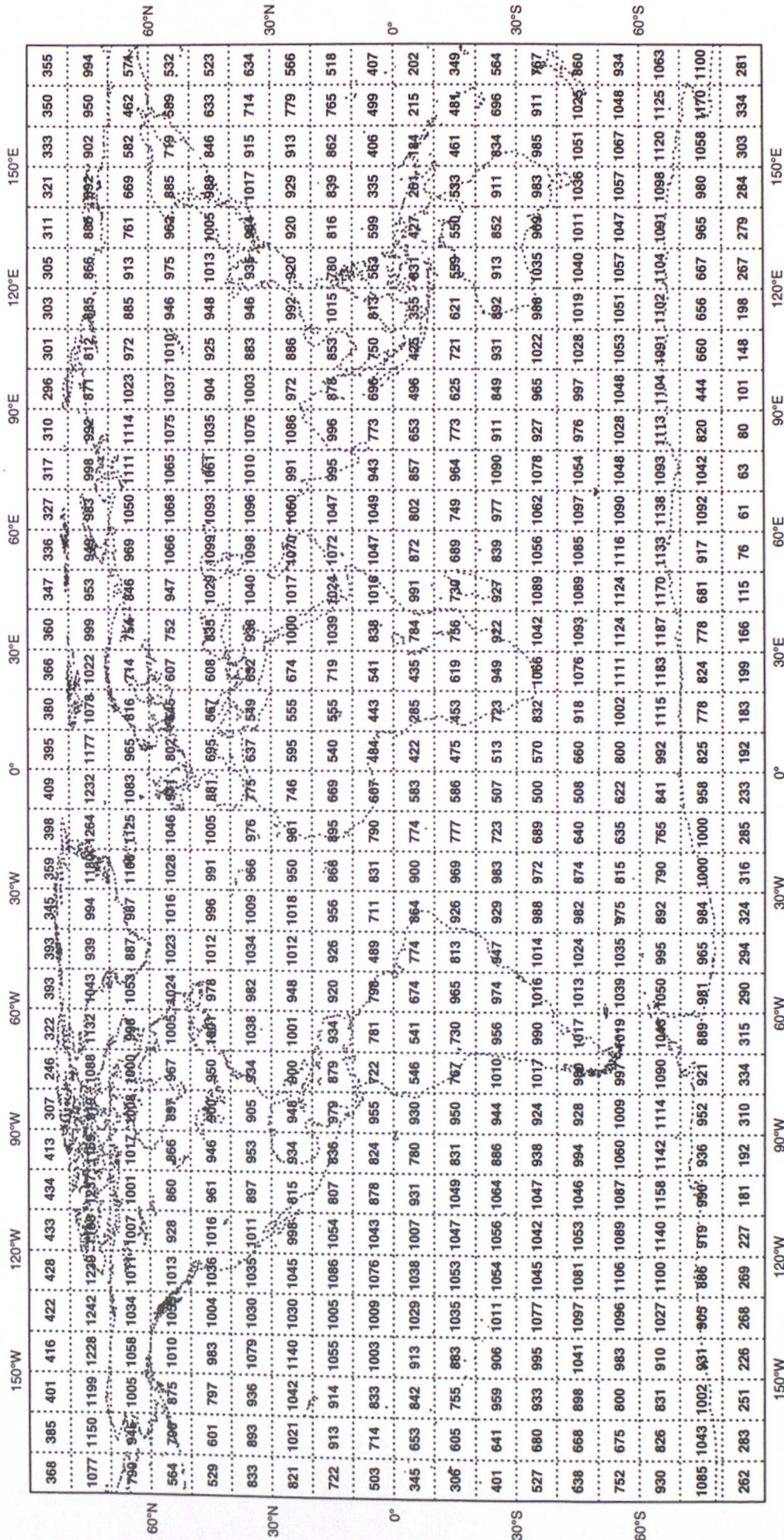


Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004

Channel: HIRS8 (Surface)

NOAA16, using all observations

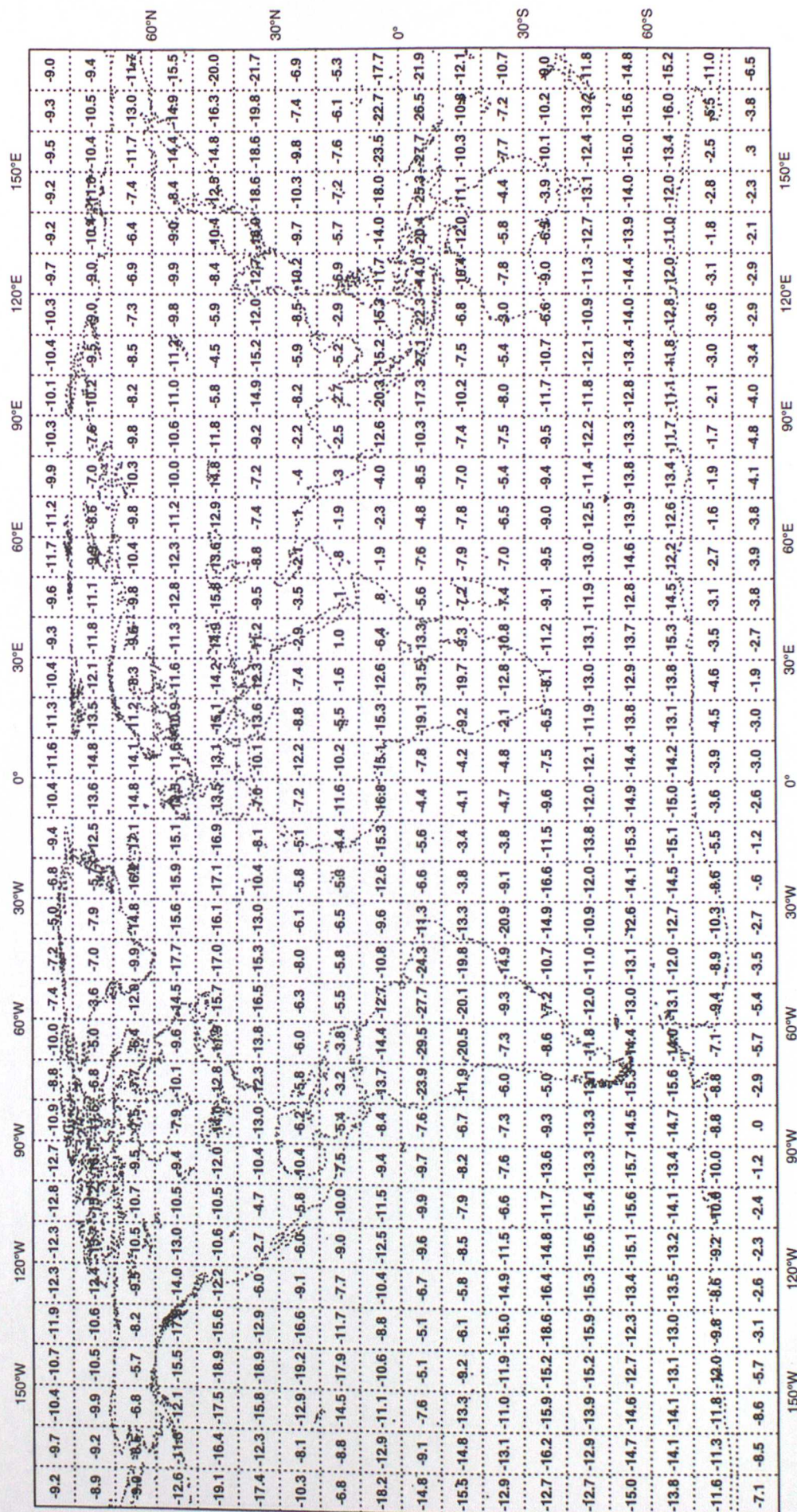


Figure 42. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations

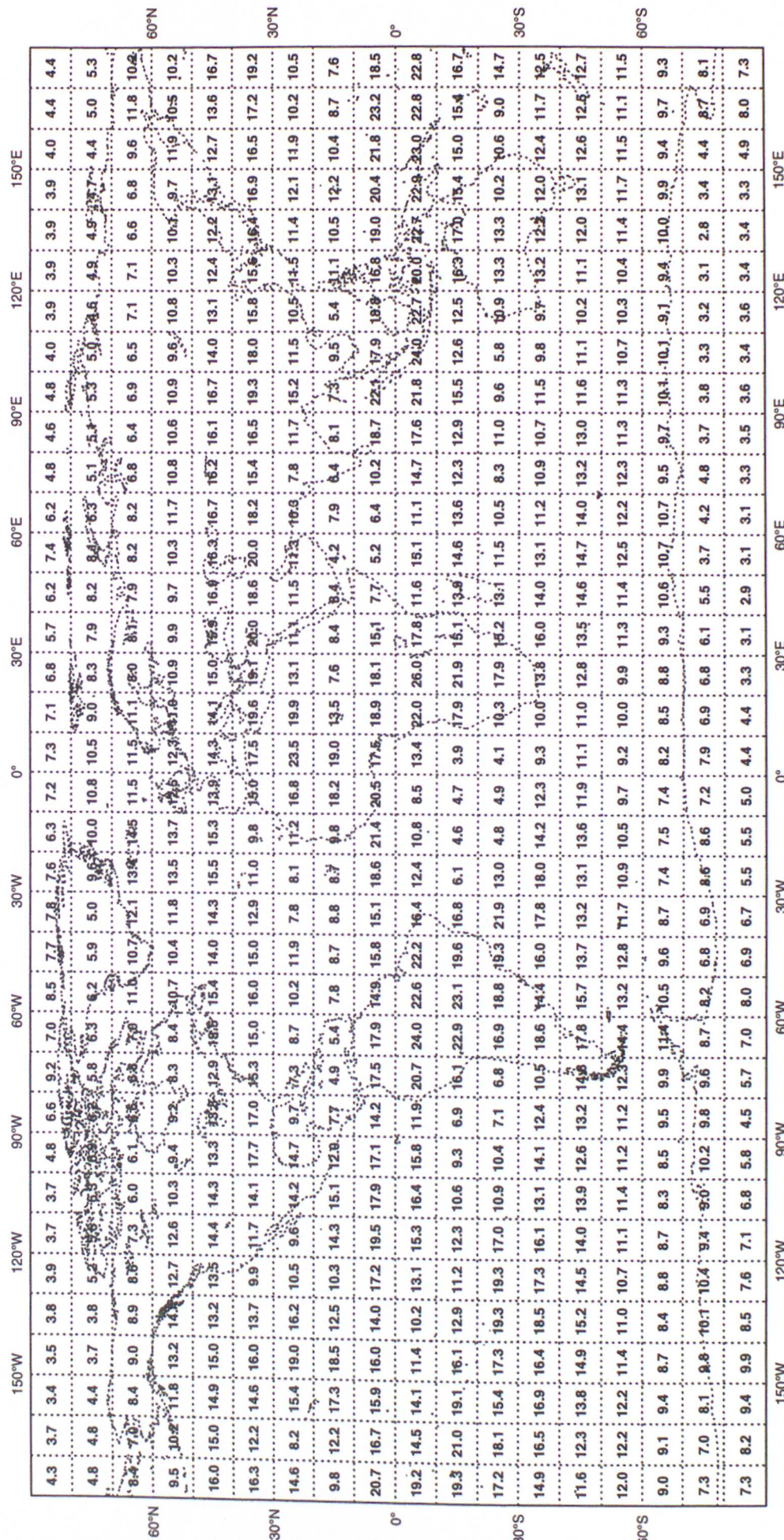


Figure 44. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

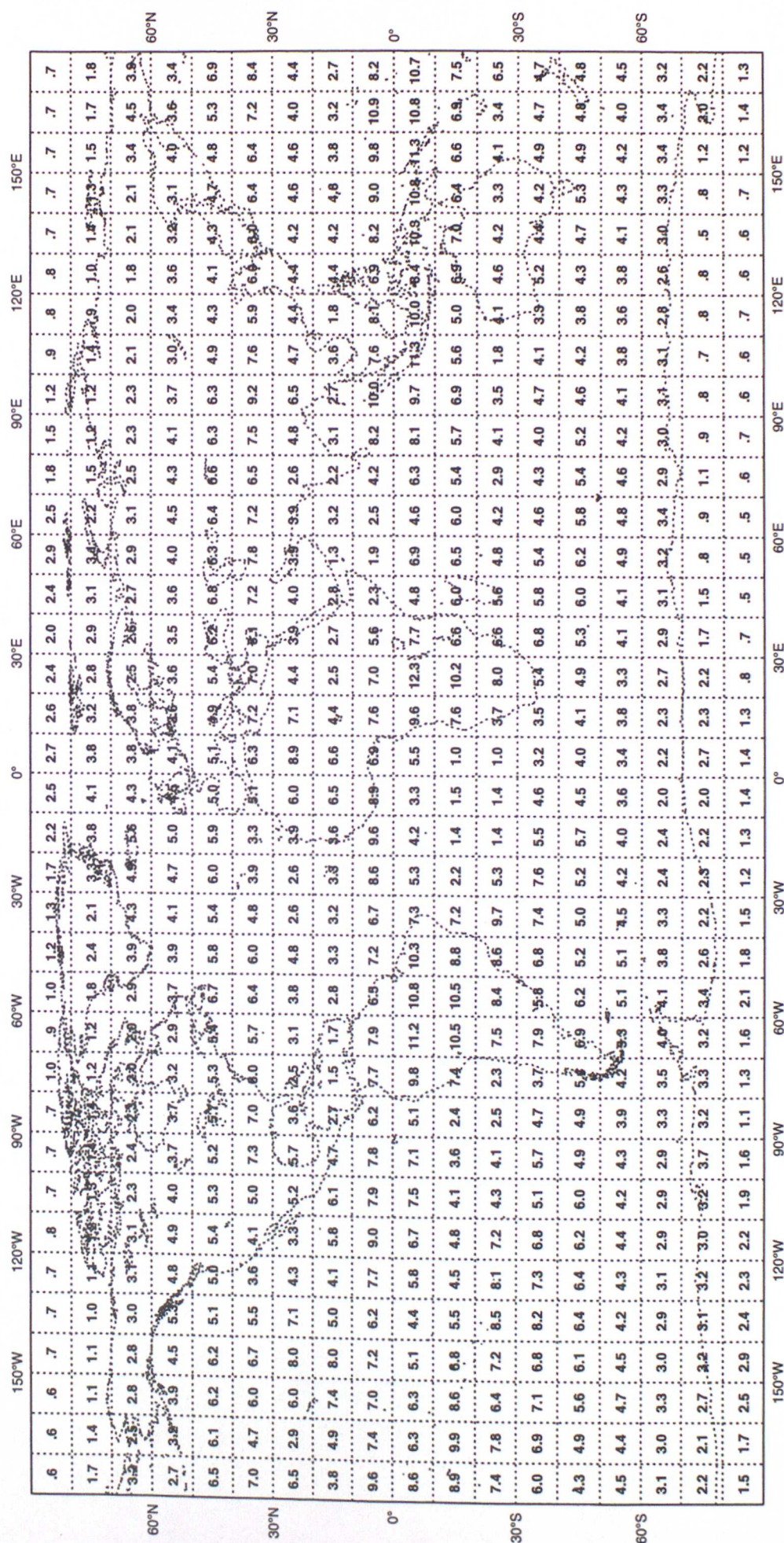


Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

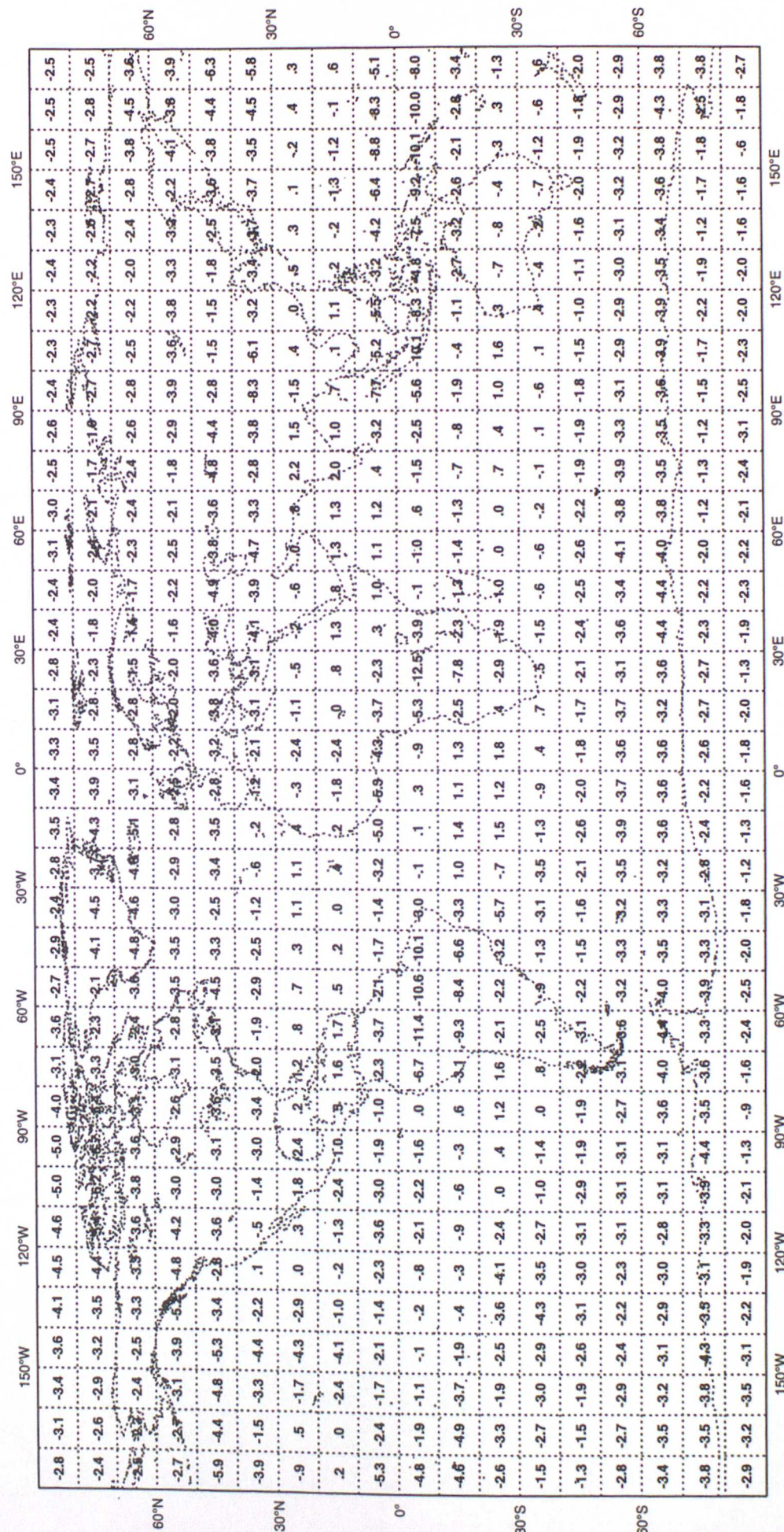
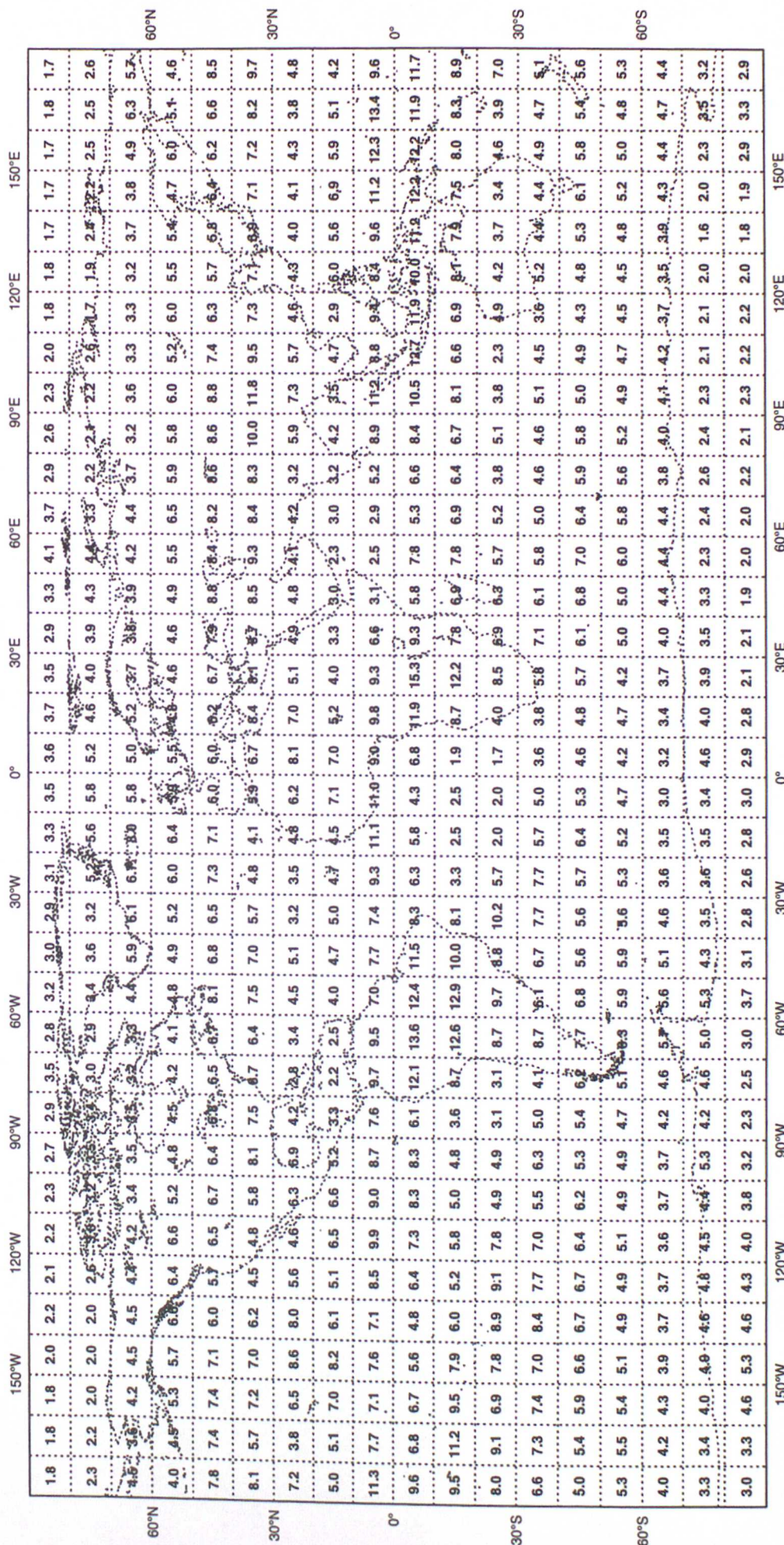


Figure 46. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



Channel: HIRS4 (400 hPa)

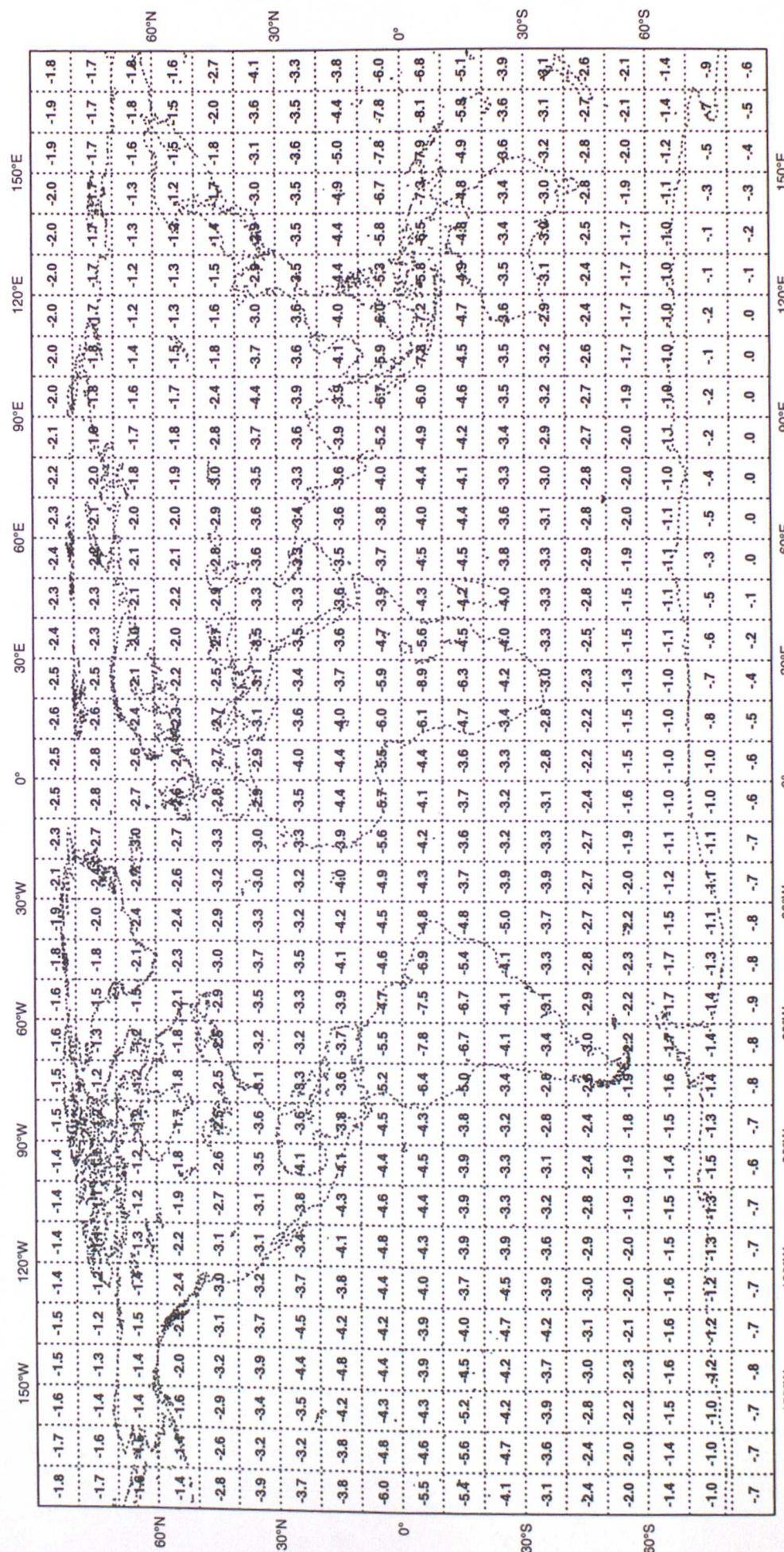
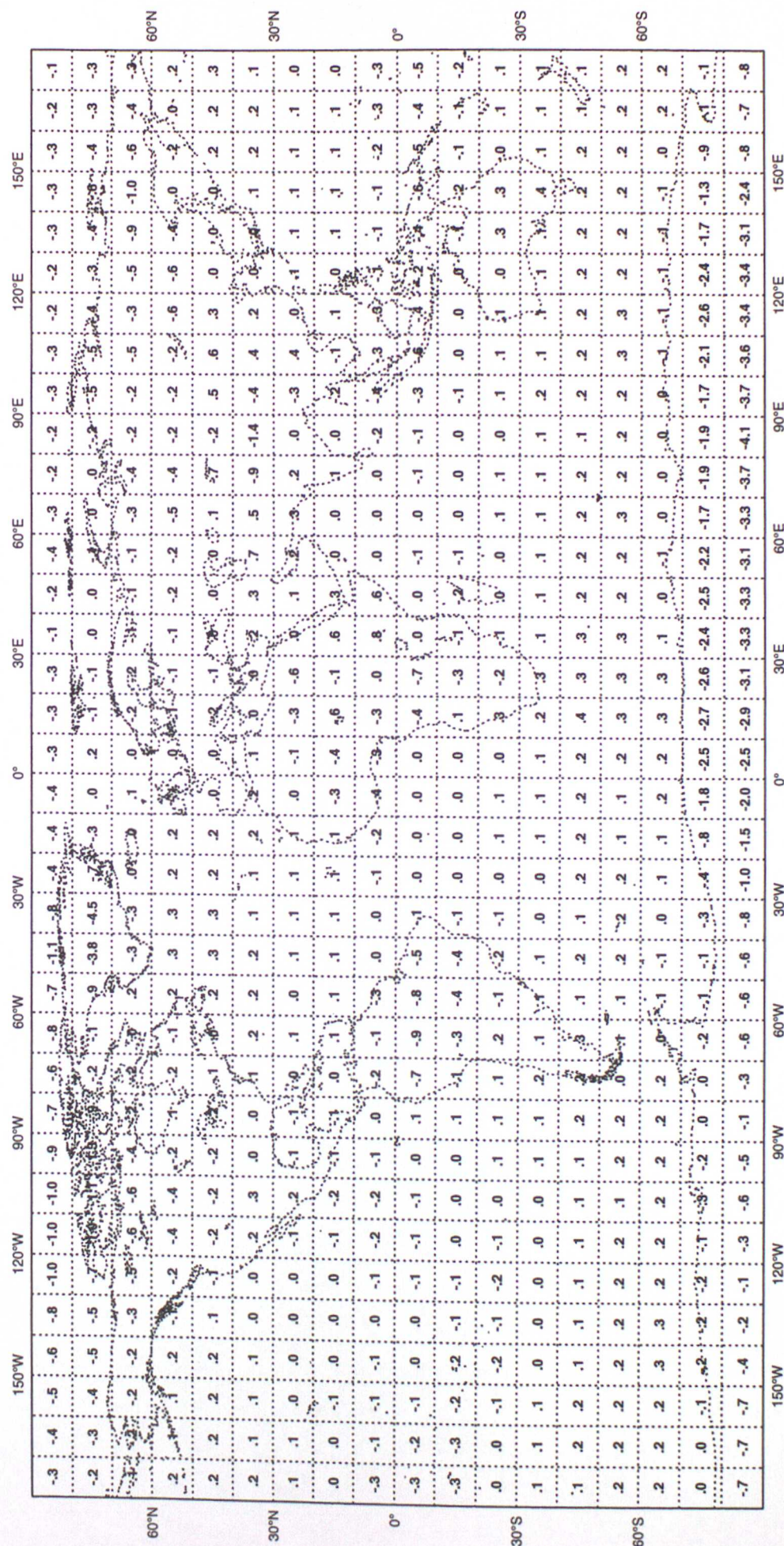
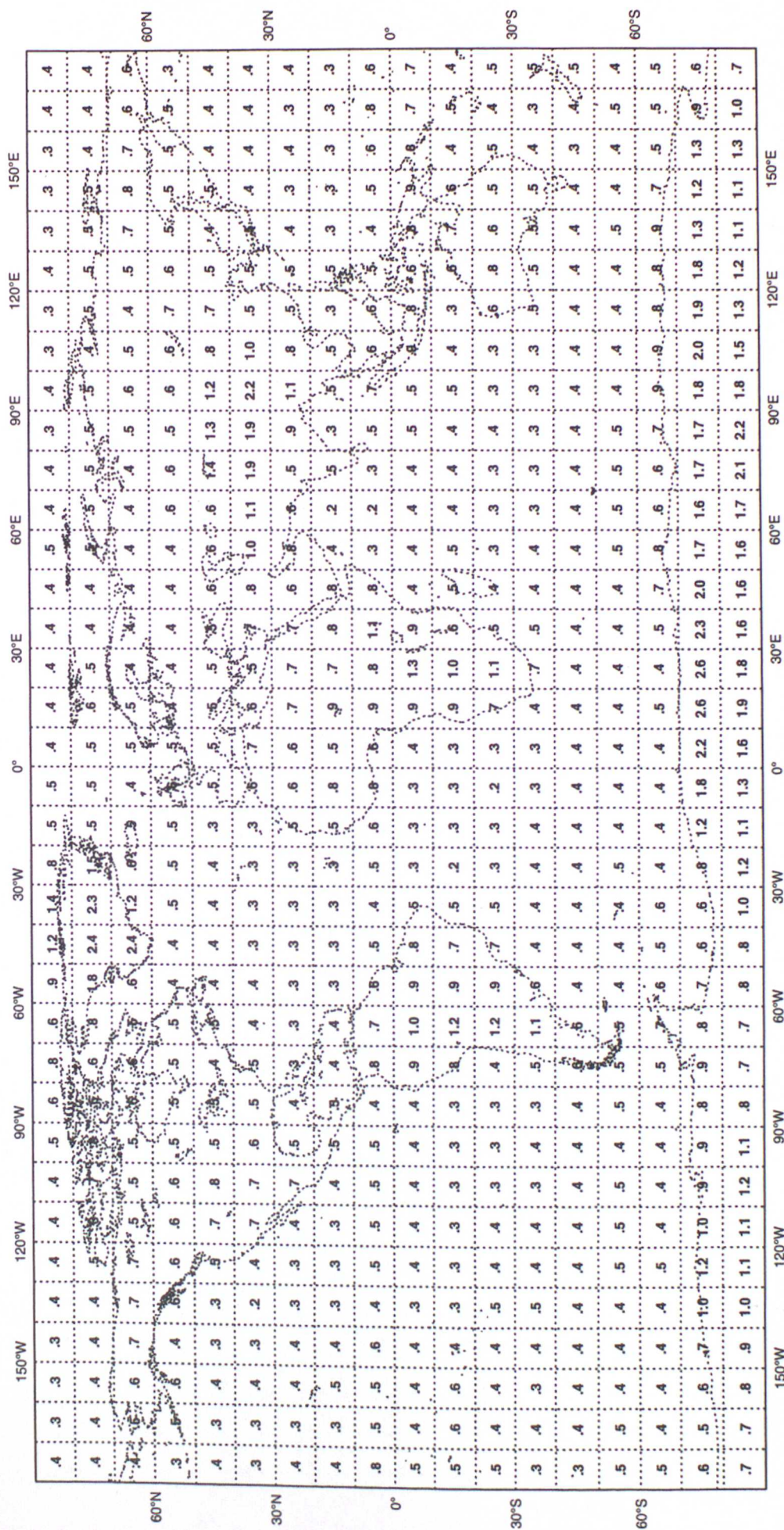


Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



NOAA16, using all observations



NOAA16, using all observations

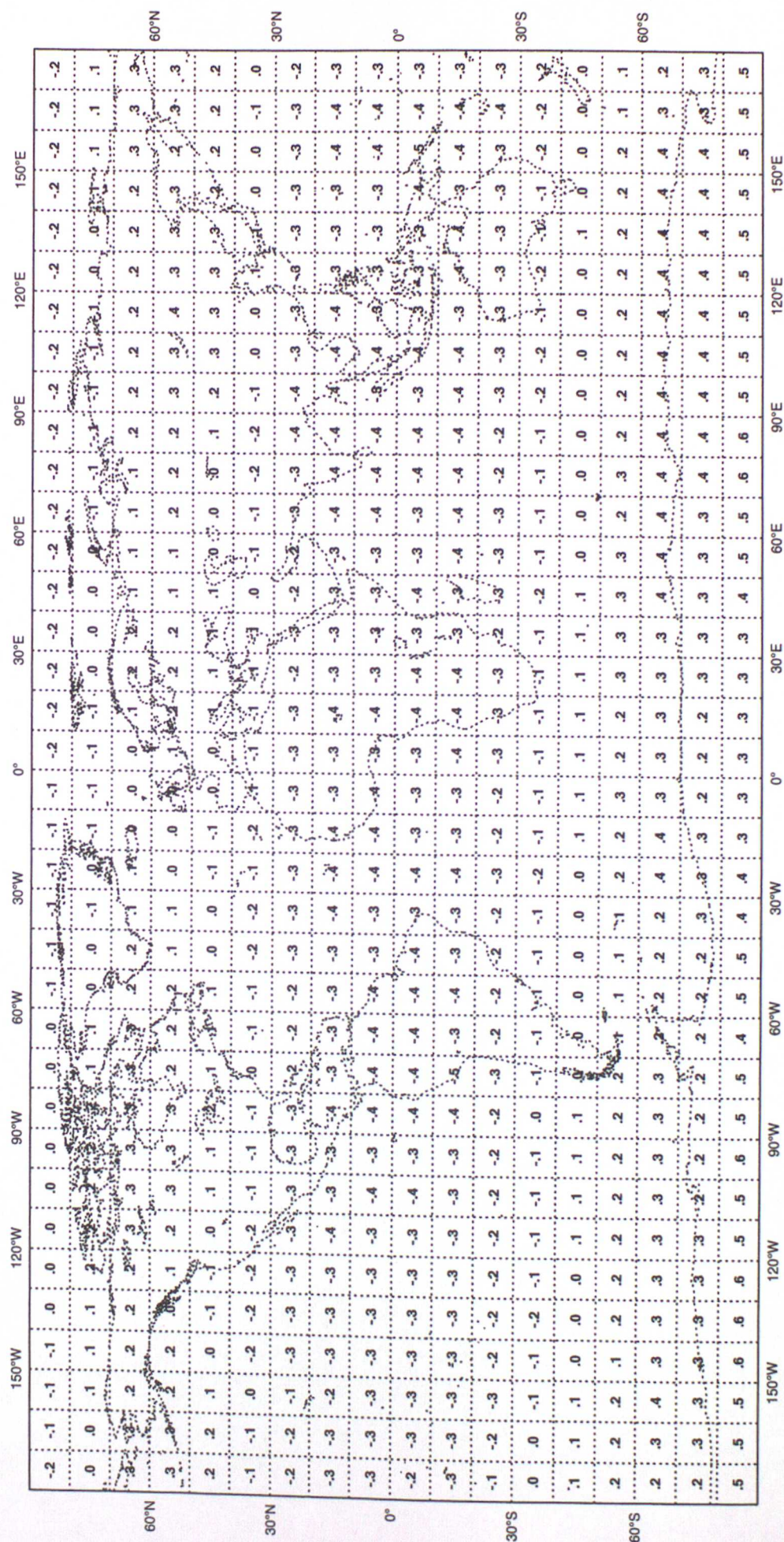


Figure 52. ATOVS SD O-B brightness temperature differences (deg C). MARCH 2004
 Channel: AMSUA-7 (300 hPa)
 NOAA16, using all observations

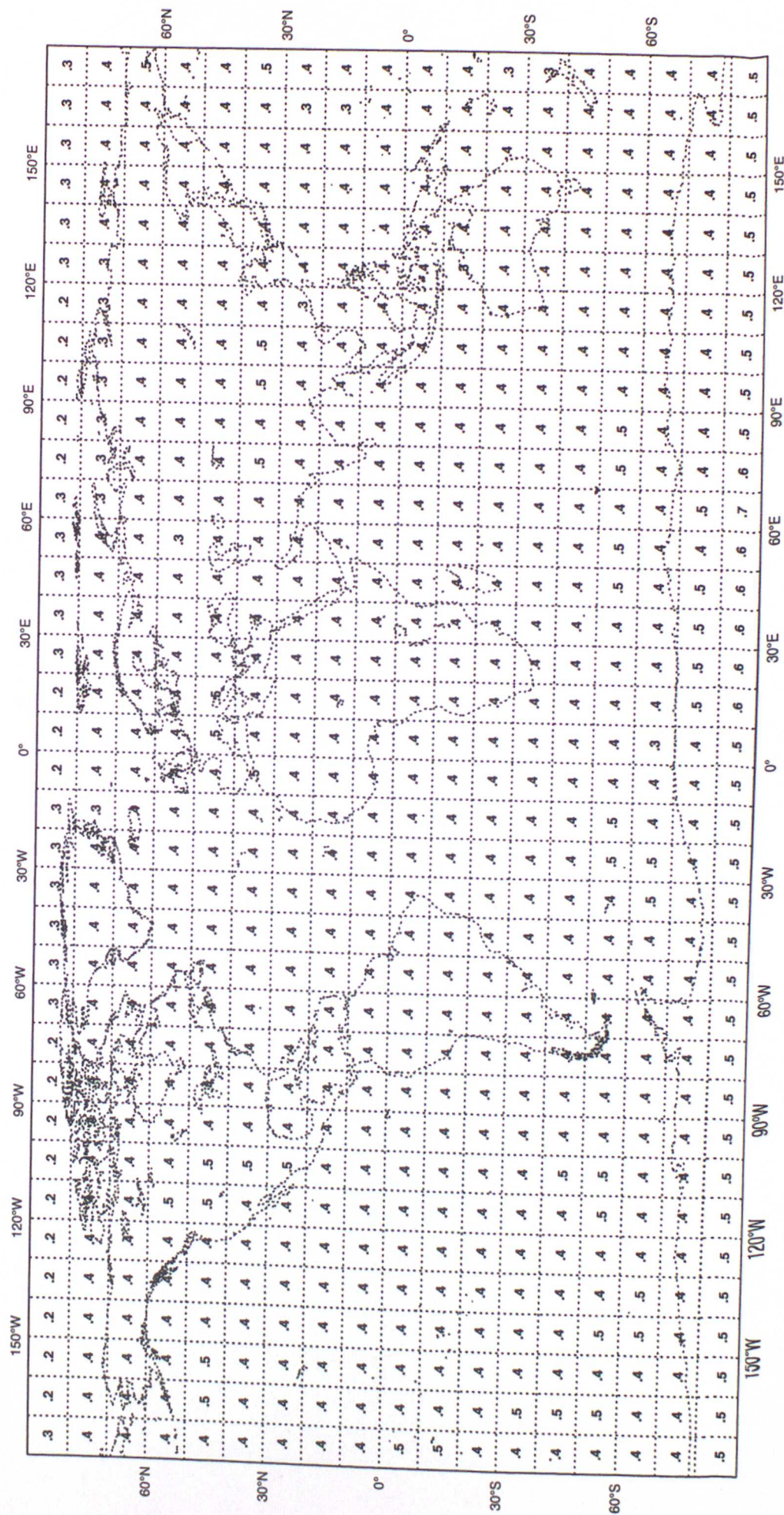


Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). MARCH 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

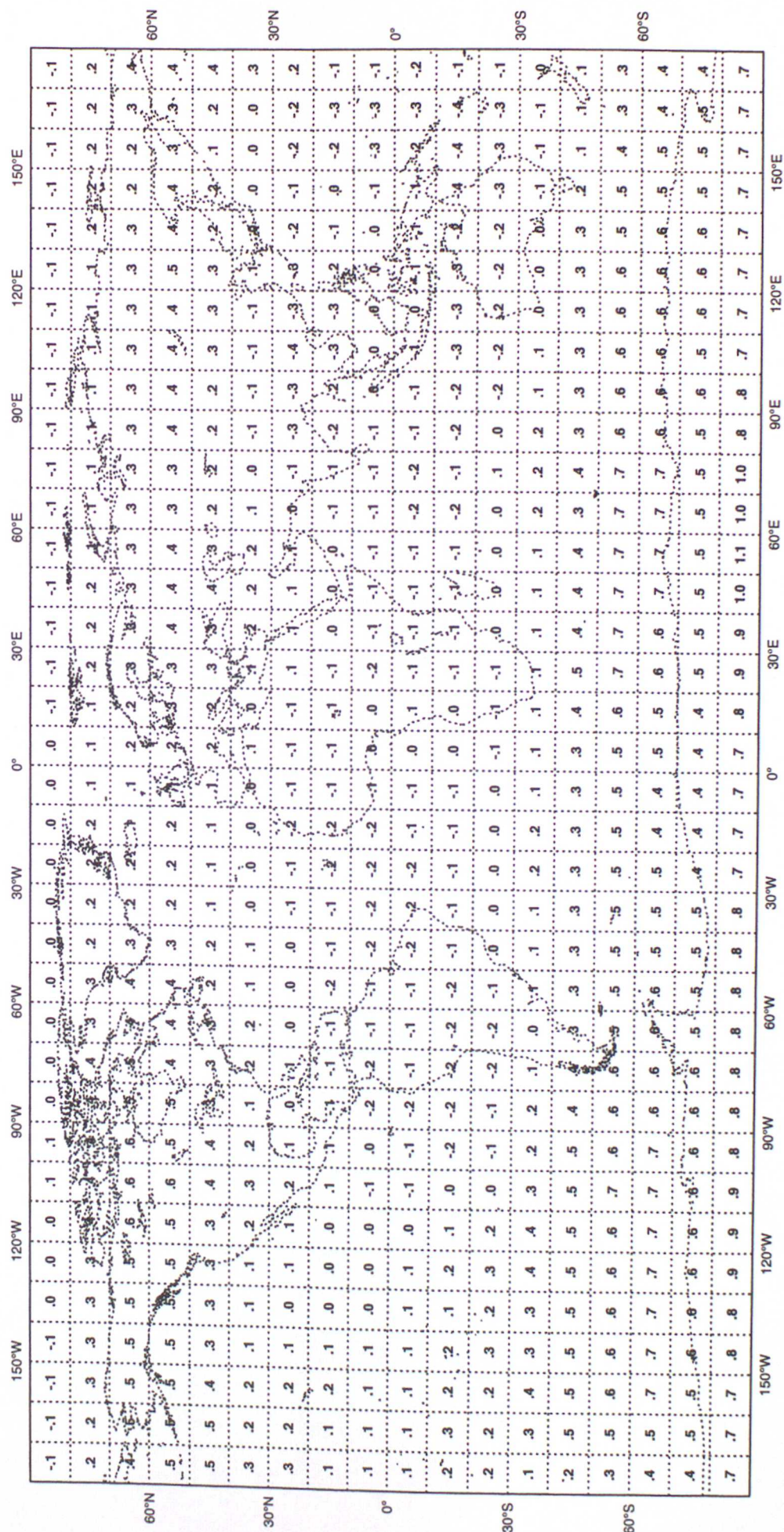


TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)

DATA TYPE:- DRIFTER

MONITORING CENTRE: EXETER

MONTH: Mar 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. A positive bias indicates the wind observation is veered to the background
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13531	21.5	-24.9	P	731	0	0	0.6	0.1	0.6
13532	30.8	-14.2	P	727	0	1	0.8	0.3	0.8
13533	17.9	-34.2	P	735	0	0	0.5	0.1	0.5
13600	18.3	-36.9	P	474	0	10	0.5	1.0	1.1
13602	20.9	-39.3	P	425	0	1	0.5	0.3	0.6
41520	11.4	-51.5	P	1037	0	69	0.5	1.7	1.7
41590	22.7	-63.7	P	531	0	0	0.4	1.0	1.1
41594	24.6	-44.6	P	561	0	0	0.4	-0.2	0.5
41595	25.8	-36.6	P	536	0	0	0.5	0.8	0.9
41600	35.9	-66.2	P	624	0	2	1.2	-0.2	1.2
41630	26.3	-71.4	P	146	0	12	0.5	0.3	0.6
41631	32.2	-73.1	P	445	0	2	1.0	0.5	1.1
41646	23.6	-74.8	P	464	0	0	0.8	0.6	1.0
41647	31.4	-80.1	P	193	0	1	0.6	0.7	1.0
41655	23.5	-67.7	P	473	0	0	0.5	0.8	0.9
41666	28.7	-51.0	P	591	0	0	0.4	0.6	0.8
44546	51.7	-26.3	P	614	0	0	1.3	-0.1	1.3
44547	56.1	-36.6	P	487	4	4	0.9	-0.1	0.9
44548	50.2	-47.3	P	184	19	46	5.2	-0.9	5.3
44551	55.6	-19.7	P	714	1	3	1.3	0.7	1.5
44603	62.3	-22.1	P	755	1	4	0.9	0.1	0.9
44605	55.0	-16.1	P	735	0	1	0.9	-0.3	1.0
44606	31.2	-57.8	P	723	0	1	0.5	-0.3	0.6
44608	36.3	-34.9	P	700	0	2	0.6	-0.2	0.7
44609	58.6	-10.1	P	694	0	10	1.5	-0.2	1.5
44611	63.5	-8.5	P	682	0	1	0.7	0.0	0.7
44612	52.4	-28.7	P	597	0	0	1.2	-0.1	1.2
44613	63.3	-15.6	P	769	0	11	0.7	-0.8	1.1
44614	65.1	-26.1	P	686	0	1	1.1	-0.7	1.3
44617	48.8	-47.0	P	631	0	0	1.2	0.5	1.3
44621	60.1	-52.7	P	163	1	1	0.8	-0.3	0.8
44623	29.2	-43.0	P	708	0	1	0.7	-0.1	0.7
44624	49.1	-46.8	P	830	0	27	1.3	1.1	1.7
44626	40.6	-56.1	P	687	0	5	1.7	0.8	1.8
44628	35.4	-29.1	P	682	0	2	0.9	-0.5	1.1
44630	32.4	-29.4	P	701	0	3	0.8	0.6	1.0
44742	48.8	-39.1	P	613	0	0	1.0	0.6	1.2
44743	50.3	-33.5	P	621	0	0	0.8	-0.5	1.0
44744	46.9	-32.4	P	749	0	4	1.6	0.7	1.7
44745	51.2	-30.0	P	737	0	2	1.4	0.2	1.4
44747	49.2	-28.6	P	580	1	1	1.3	-0.5	1.4
44761	54.0	-43.5	P	656	0	0	1.1	0.8	1.4
44762	54.3	-39.9	P	661	0	2	1.5	1.2	2.0
44765	40.9	-65.5	P	749	0	25	0.8	-0.4	0.9
44766	47.9	-29.7	P	581	0	2	1.1	0.2	1.1
44771	50.4	-20.3	P	210	0	26	1.0	-0.4	1.0
44772	56.3	-39.0	P	466	2	43	3.3	-0.7	3.4
44773	63.3	-31.4	P	365	0	27	1.5	-0.4	1.6
44777	29.8	-22.8	P	255	0	14	0.6	-0.3	0.7
44778	40.5	-19.0	P	269	0	16	0.7	0.2	0.8
44780	61.4	-27.5	P	662	0	39	0.9	-0.2	0.9
62514	32.8	-26.9	P	727	0	2	1.0	0.5	1.2
62515	21.5	-65.3	P	739	0	0	0.4	0.0	0.4
62517	28.9	-32.4	P	734	0	1	0.5	-0.6	0.8
62551	40.7	-21.4	P	771	0	8	0.7	0.1	0.7
62552	32.2	-22.5	P	738	0	1	0.7	0.8	1.0
62574	48.4	-9.3	P	594	1	1	0.6	0.8	1.0
62575	45.0	-8.3	P	7	86	86	0.0	0.2	0.2
62576	46.7	-7.1	P	129	0	0	0.4	-0.1	0.4
62712	60.6	-14.6	P	705	0	3	0.7	-0.1	0.7

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
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62801	37.0	-16.9	P	641	0	2	0.5	0.6	0.8
62804	45.4	-5.8	P	947	0	30	0.9	-0.2	0.9
64523	67.2	-19.7	P	176	26	82	7.1	-2.7	7.6
65597	52.3	-50.1	P	474	0	28	1.2	-0.6	1.4
65598	57.3	-41.6	P	396	0	34	1.9	-1.3	2.3

65599	56.4	-40.9	P	277	0	25	0.9	-0.5	1.0
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IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
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13600	18.3	-36.9	SPEED	468	0	100	1.2	-1.5	1.9
13602	20.9	-39.3	SPEED	421	0	100	1.0	-1.0	1.5
41590	22.7	-63.7	SPEED	529	0	100	1.2	-0.9	1.5
41594	24.6	-44.6	SPEED	534	0	100	1.4	-0.9	1.6
41595	25.8	-36.6	SPEED	517	0	100	1.3	-0.9	1.6

41630	26.3	-71.4	SPEED	1	0	100	0.0	5.9	5.9
41647	31.4	-80.1	SPEED	17	0	100	1.4	3.9	4.2
44546	51.7	-26.3	SPEED	613	0	100	3.1	-0.1	3.1
44551	55.6	-19.7	SPEED	667	1	100	2.6	0.9	2.8
62574	48.4	-9.3	SPEED	466	0	100	1.4	-1.5	2.1

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
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13600	18.3	-36.9	DIRN.	337	0	0	12.8	-11.2	17.0
13602	20.9	-39.3	DIRN.	277	0	0	11.9	-15.7	19.7
41590	22.7	-63.7	DIRN.	373	0	0	14.3	-4.4	15.0
41594	24.6	-44.6	DIRN.	351	0	0	14.6	-3.6	15.1
41595	25.8	-36.6	DIRN.	322	0	0	16.5	-25.0	30.0

41647	31.4	-80.1	DIRN.	17	0	0	21.8	3.8	22.2
44546	51.7	-26.3	DIRN.	498	0	0	14.8	2.2	14.9
44551	55.6	-19.7	DIRN.	619	1	0	29.5	1.9	29.6
62574	48.4	-9.3	DIRN.	403	0	0	9.7	2.8	10.0

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				BIAS
		PG	PR	RMS	PG		PR	PC	RMS		
AAL	642	1	13	2.0	0.1	444	0	10	0	6.7	1.0
ACA	750	1	3	1.5	-0.3	515	0	2	0	5.7	0.7
AEA	237	2	6	1.6	0.2	118	1	6	0	8.0	0.7
AEL	382	1	8	1.8	-0.3	306	0	9	0	7.3	1.2
AEW	80	1	1	1.5	-0.7	50	0	0	0	5.6	0.6
AFL	376	0	4	2.0	0.5	234	0	2	0	7.0	0.6
AFR	873	0	6	2.0	0.6	738	0	7	0	7.4	0.5
AJM	264	1	4	1.7	-0.6	182	0	4	0	6.4	0.4
AMT	92	0	12	1.8	0.1	95	0	8	0	5.3	-0.3
AMX	205	2	4	1.4	-0.1	119	0	100	0	8.7	0.1
AZA	214	2	8	2.0	0.1	167	1	11	0	10.6	1.2
BAL	250	2	10	1.4	0.1	214	1	13	0	8.2	1.4
BAW	472	1	11	1.9	-0.5	380	0	13	0	9.1	-0.1
BPA	262	1	9	1.8	-0.1	209	0	10	0	7.6	0.0
BWA	124	1	9	2.2	-0.5	81	0	4	0	7.8	0.3
CFC	55	0	7	1.5	-0.5	57	0	9	0	5.7	0.9
CFG	446	0	3	1.4	-0.3	340	0	5	0	7.0	0.8
CKS	120	0	8	2.3	1.1	103	0	9	0	10.8	-0.3
CLX	227	1	3	1.6	-0.5	182	0	3	0	5.8	0.1
COA	134	0	40	1.5	0.0	60	0	42	0	8.6	0.9
CRL	414	0	6	1.7	0.4	286	0	5	0	8.1	0.9
CUB	104	2	5	1.5	-0.3	80	0	4	0	5.8	-0.3
DAL	860	1	6	1.5	-0.6	606	0	5	0	6.3	0.7
DCS	47	0	6	1.9	0.2	38	3	3	0	5.4	-0.4
DHL	115	2	100	6.1	-5.8	86	0	100	0	14.9	1.7
DLH	561	0	11	1.7	0.1	535	1	12	0	7.6	0.6
EDW	47	0	9	1.6	0.0	33	0	9	0	8.2	-0.1
EEZ	68	1	3	1.4	0.0	58	0	7	0	6.9	1.5
EIA	175	1	100	2.8	0.9	171	0	100	0	20.7	8.0
ELY	174	1	6	1.7	-0.1	133	1	9	0	9.0	1.1
ETH	28	0	18	1.2	0.0	29	0	17	0	4.8	2.4
FCA	66	2	8	2.2	0.5	44	0	9	0	10.2	0.2
FDX	643	1	27	1.7	0.1	497	0	25	0	8.1	0.9
FIN	244	1	6	1.7	0.2	190	1	6	0	6.3	0.7
FWI	241	0	6	1.7	-0.4	195	0	7	0	7.7	1.2
GAF	33	3	9	2.3	-1.5	24	0	4	0	5.5	1.7
GCO	196	1	8	1.6	-0.1	140	0	14	0	10.2	2.7
GRL	76	1	7	2.1	0.6	71	0	3	0	7.4	0.3
GTI	157	0	11	1.6	0.2	146	0	10	0	7.4	1.0
HXL	128	0	9	1.8	0.6	92	1	13	0	7.7	1.3
IBE	1059	0	7	1.7	0.3	675	1	8	0	8.2	0.8
ICE	798	0	2	1.5	-0.4	546	0	2	0	6.5	0.7
JAL	22	0	5	1.9	-0.5	22	5	9	0	6.4	1.1
KLM	901	0	3	1.7	-0.1	630	0	3	0	7.4	0.0
LAN	40	0	8	1.9	0.7	40	0	10	0	8.0	0.5
LDI	340	1	5	1.5	0.1	228	0	4	0	8.0	-0.6
LOT	109	0	1	1.9	-1.3	80	3	4	0	5.7	0.5
LTU	690	1	7	1.6	-0.2	523	0	5	0	6.4	1.1
MON	62	0	5	1.7	0.1	50	0	4	0	5.3	1.5
MPD	103	0	2	1.4	0.4	54	0	6	0	7.3	1.1
MPH	404	0	3	1.9	-1.1	288	0	3	0	8.3	0.7
MYT	163	1	7	2.0	0.2	122	0	6	0	7.2	0.4
NAO	36	3	6	2.2	0.2	30	0	13	0	10.4	0.5
NCA	40	0	0	1.2	-0.1	37	0	3	0	5.9	0.8
NWA	2058	1	3	1.7	0.2	2034	0	3	0	6.5	0.5
OAE	208	0	5	1.4	-0.2	146	0	100	0	18.4	6.6
PAC	192	0	6	1.7	-0.2	138	0	7	0	7.1	0.3
RAM	221	1	3	1.8	0.4	108	0	100	0	8.5	1.5
RCH	318	0	100	3.4	-1.0	220	0	100	0	12.4	1.2

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	PG	WIND			BIAS
		PG	PR	RMS					PR	PC	RMS	
RRR	42	0	10	1.6	-0.3		42	0	17	0	10.5	0.9
RZO	107	0	8	1.7	-0.9		66	0	11	0	11.1	-0.5
SEU	320	2	5	1.7	-0.1		257	0	3	0	6.0	0.7
TAP	208	0	7	1.5	-0.3		111	0	10	0	7.0	0.6
TCX	61	0	2	1.2	0.1		49	0	2	0	9.7	0.2
UAE	21	0	5	0.9	0.0		21	0	5	0	5.0	0.6
UAL	390	1	66	2.0	-1.0		287	0	63	0	8.4	0.5
UPS	1068	0	46	1.5	0.0		1028	1	46	0	7.7	0.2
USA	132	0	2	1.8	0.2		88	0	9	0	8.9	1.9
VIR	162	0	2	1.6	-0.1		112	0	2	0	5.7	0.9
VPB	38	13	16	2.0	1.3		21	0	10	0	9.0	1.9
WOA	337	1	15	1.7	0.3		298	0	16	0	8.5	0.4
XLA	56	0	0	1.0	0.1		50	0	2	0	9.1	-0.3

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	PG	WIND			BIAS
		PG	PR	RMS					PR	PC	RMS	
EU	28122	0	18	1.3	0.1		28122	0	17	0	4.7	0.6
TN	22	0	5	1.9	-0.2		22	0	9	0	7.1	0.9

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	PG	WIND			BIAS
		PG	PR	RMS					PR	PC	RMS	
N	519	3	7	2.2	0.5		387	0	4	0	8.0	1.3
U	18466	0	25	1.5	0.1		18466	0	23	0	5.2	0.6

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	21	0	9.9	17.2	14.0
DBBH	12	Z	100	19	0	14.0	25.8	21.7
EBUQ	12	Z	100	9	0	30.9	85.2	79.4
ELML7	00	Z	100	1	0	0.0	15.0	15.0
ELML7	12	Z	100	2	0	4.0	25.3	25.0
FQFL	00	Z	100	7	0	95.0	124.2	80.0
FQFL	12	Z	100	8	0	78.0	95.7	55.4
FQFM	00	Z	100	8	0	10.9	15.1	10.4
FQFM	12	Z	100	8	0	12.4	23.9	20.4
KHRH	00	Z	100	7	0	18.1	21.9	12.3
KHRH	12	Z	100	5	0	21.9	28.1	17.6
KRPD	00	Z	100	1	0	0.0	23.0	23.0
KRPD	12	Z	100	1	0	0.0	26.0	26.0
LDWR	00	Z	100	29	0	9.4	22.1	-20.0
LDWR	12	Z	100	29	0	16.4	25.7	-19.8
OXTS2	00	Z	100	10	0	13.2	17.4	-11.4
OXTS2	12	Z	100	10	0	9.3	11.7	-7.1
OXYH2	00	Z	100	4	1	26.7	28.5	9.8
OXYH2	12	Z	100	4	0	5.1	8.5	-6.8
WAAH	00	Z	100	4	1	17.5	28.5	22.5
WAAH	12	Z	100	4	0	26.7	31.1	16.0
WPKD	00	Z	100	6	0	11.9	14.8	8.8
WPKD	12	Z	100	2	1	0.5	14.5	14.5
ZCBP6	00	Z	100	12	0	15.4	44.8	42.1
ZCBP6	12	Z	100	8	0	46.0	73.8	57.8
03953	00	Z	100	29	0	15.2	17.0	7.8
03953	12	Z	100	29	0	11.6	13.5	6.8
04018	00	Z	100	28	0	13.8	17.5	-10.8
04018	12	Z	100	28	0	20.7	24.3	-12.8
04220	00	Z	100	29	0	12.3	34.0	-31.7
04220	12	Z	100	28	0	11.9	30.8	-28.4
04270	00	Z	100	28	0	14.6	27.8	-23.6
04270	12	Z	100	29	0	18.9	26.4	-18.4
04339	00	Z	100	27	1	10.3	24.6	-22.3
04339	12	Z	100	29	0	11.0	21.8	-18.8
04360	00	Z	100	28	1	19.7	31.7	-24.8
04360	12	Z	100	29	0	22.9	32.8	-23.5
08001	00	Z	100	26	1	22.3	24.2	-9.4
08001	12	Z	100	26	0	18.9	19.7	-5.5
08508	12	Z	100	28	0	15.5	42.7	39.8
08522	12	Z	100	24	0	11.6	22.6	19.4
08594	12	Z	100	24	0	24.9	35.5	25.3
71600	00	Z	100	29	0	13.6	16.4	-9.3
71600	12	Z	100	30	0	20.7	23.4	-10.9
72201	00	Z	100	28	0	10.6	24.1	21.7
72201	12	Z	100	29	0	10.6	30.6	28.7
72402	00	Z	100	29	0	17.9	30.1	24.2
72402	12	Z	100	29	0	16.5	26.7	21.0
74494	00	Z	100	20	0	17.4	18.6	6.4
74494	12	Z	100	25	0	14.5	14.7	-2.8
78016	00	Z	100	28	0	11.3	35.8	33.9
78016	12	Z	100	25	0	19.4	46.4	42.1

TABLE 11

**MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Mar 2004**

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	21	0	7.5	10.6	-7.4
DBBH	12	Z	500	19	0	6.9	9.5	-6.5
EBUQ	12	Z	500	9	0	51.7	74.5	53.7
ELML7	00	Z	500	1	0	0.0	8.0	-8.0
ELML7	12	Z	500	2	0	3.0	3.2	1.0
FQFL	00	Z	500	6	1	18.1	22.3	13.0
FQFL	12	Z	500	8	1	24.0	24.8	-6.5
FQFM	00	Z	500	8	0	6.1	13.3	-11.9
FQFM	12	Z	500	9	0	9.1	11.9	-7.7
KHRH	00	Z	500	7	0	11.3	14.4	8.9
KHRH	12	Z	500	5	0	9.0	9.4	2.8
KRPD	00	Z	500	1	0	0.0	2.0	2.0
KRPD	12	Z	500	1	0	0.0	4.0	-4.0
LDWR	00	Z	500	29	0	10.8	10.9	-1.4
LDWR	12	Z	500	29	0	8.2	9.1	-4.0
OXTS2	00	Z	500	11	0	9.6	12.5	8.0
OXTS2	12	Z	500	11	0	12.7	15.1	8.2
OXYH2	00	Z	500	4	1	32.3	46.4	33.3
OXYH2	12	Z	500	5	0	5.9	6.8	3.4
PACDG	00	Z	500	1	0	0.0	23.0	23.0
WAAH	00	Z	500	6	1	3.0	3.2	-1.0
WAAH	12	Z	500	5	0	18.9	19.0	1.6
WPKD	00	Z	500	6	0	5.9	5.9	-0.3
WPKD	12	Z	500	3	1	5.4	6.1	2.7
ZCBP6	00	Z	500	14	0	12.5	32.8	30.3
ZCBP6	12	Z	500	8	0	21.8	46.0	40.5
03953	00	Z	500	29	0	6.6	7.6	3.7
03953	12	Z	500	30	0	9.6	11.2	5.8
04018	00	Z	500	29	0	9.8	10.4	3.6
04018	12	Z	500	30	0	18.7	18.7	1.5
04220	00	Z	500	29	0	11.0	11.6	-3.6
04220	12	Z	500	29	0	9.3	9.6	-2.2
04270	00	Z	500	29	0	13.1	13.2	1.7
04270	12	Z	500	30	0	9.5	9.9	2.7
04339	00	Z	500	28	1	7.1	7.1	0.1
04339	12	Z	500	29	0	8.9	9.0	1.5
04360	00	Z	500	28	1	16.9	17.7	-5.1
04360	12	Z	500	29	0	19.5	20.9	-7.6
08001	00	Z	500	27	1	12.5	15.4	-9.0
08001	12	Z	500	27	0	10.4	10.8	-3.1
08508	12	Z	500	28	0	8.4	9.4	4.1
08522	12	Z	500	25	0	11.2	12.6	5.8
08594	12	Z	500	27	0	6.2	6.2	0.9
71600	00	Z	500	29	0	10.4	11.9	-5.7
71600	12	Z	500	30	0	12.7	15.0	-8.0
72201	00	Z	500	29	0	5.9	6.9	-3.5
72201	12	Z	500	30	0	4.6	7.5	-5.9
72402	00	Z	500	29	0	6.1	6.1	-0.3
72402	12	Z	500	29	0	11.2	11.3	-1.4
74494	00	Z	500	27	0	6.3	8.8	-6.1
74494	12	Z	500	30	0	6.7	9.5	-6.7
78016	00	Z	500	29	0	6.9	10.2	7.5
78016	12	Z	500	26	0	8.0	9.9	5.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s ⁻¹
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	21	0	0	4.1	-1.0	-0.3
DBBH	12	V	100	19	0	0	4.7	-0.3	-2.0
EBUQ	12	V	100	5	0	20	17.1	-12.0	7.3
ELML7	00	V	100	1	0	0	3.5	1.9	3.0
ELML7	12	V	100	2	0	0	4.5	0.2	3.2
FQFL	00	V	100	7	0	28	16.5	2.2	5.7
FQFL	12	V	100	8	0	12	11.0	3.0	2.2
FQFM	00	V	100	8	0	0	4.1	1.5	2.3
FQFM	12	V	100	8	0	0	3.6	0.3	0.8
KHRH	00	V	100	6	0	16	9.7	3.6	0.2
KHRH	12	V	100	4	0	50	10.7	8.0	5.9
KRPD	00	V	100	1	0	0	5.9	-5.8	0.7
KRPD	12	V	100	1	0	0	6.5	6.1	2.1
LDWR	00	V	100	29	0	0	3.7	0.8	0.6
LDWR	12	V	100	29	0	0	3.1	0.0	0.5
OXTS2	00	V	100	10	0	20	14.0	-2.4	-2.2
OXTS2	12	V	100	9	0	0	2.9	1.5	-0.3
OXYH2	00	V	100	1	0	0	1.1	1.1	-0.2
OXYH2	12	V	100	3	0	0	6.3	-1.5	-2.8
WAAH	00	V	100	3	0	66	29.7	6.1	12.0
WAAH	12	V	100	1	0	100	9.5	-6.1	-7.2
WPKD	00	V	100	6	0	0	3.5	-0.6	-0.5
WPKD	12	V	100	3	0	0	2.3	-1.5	-0.9
ZCBP6	00	V	100	10	0	0	5.3	-2.1	2.4
ZCBP6	12	V	100	6	0	0	3.4	0.9	0.0
03953	00	V	100	29	0	0	3.6	0.4	0.0
03953	12	V	100	28	0	0	3.0	0.7	-0.1
04018	00	V	100	26	0	0	3.1	-0.3	0.6
04018	12	V	100	26	0	0	2.8	-0.4	0.3
04220	00	V	100	29	0	0	3.5	-0.3	0.8
04220	12	V	100	28	0	0	3.7	0.7	1.3
04270	00	V	100	28	0	0	4.3	-0.1	0.0
04270	12	V	100	29	0	0	5.7	0.9	1.3
04339	00	V	100	20	0	0	7.3	1.0	0.9
04339	12	V	100	27	0	3	6.5	1.8	-0.4
04360	00	V	100	28	0	0	3.9	0.2	-0.7
04360	12	V	100	27	0	0	3.9	-0.3	1.2
08001	00	V	100	27	0	0	4.4	1.8	-0.3
08001	12	V	100	24	0	0	4.6	-0.4	0.3
08508	12	V	100	13	0	0	5.2	-0.4	-1.8
08522	12	V	100	22	0	0	4.7	-0.4	-0.7
08594	12	V	100	22	0	100	4.4	-0.2	2.4
71600	00	V	100	28	0	0	3.7	0.4	-0.2
71600	12	V	100	30	0	0	4.0	0.9	0.6
72201	00	V	100	28	0	0	3.3	1.3	0.7
72201	12	V	100	29	0	0	4.6	0.9	0.5
72402	00	V	100	29	0	0	4.6	0.3	-0.5
72402	12	V	100	30	0	0	3.3	-0.4	-1.0
74494	00	V	100	19	0	100	3.4	-0.5	-0.3
74494	12	V	100	25	0	100	3.6	0.3	0.6
78016	00	V	100	27	0	0	5.7	0.1	0.5
78016	12	V	100	23	0	0	5.1	-0.9	1.4

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Mar 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s ⁻¹
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	21	0	0	3.4	-0.5	-0.2
DBBH	12	V	500	19	0	0	3.6	-0.2	-0.2
EBUQ	12	V	500	7	0	42	16.2	-7.5	4.6
ELML7	00	V	500	1	0	0	4.0	-3.2	-2.4
ELML7	12	V	500	1	0	0	6.1	2.5	5.5
FQFL	00	V	500	7	0	14	11.0	-0.9	3.9
FQFL	12	V	500	9	0	11	10.8	1.1	-0.7
FQFM	00	V	500	8	0	0	3.2	-1.4	-1.0
FQFM	12	V	500	8	0	0	3.0	0.5	1.3
KHRH	00	V	500	6	0	16	9.0	5.0	2.8
KHRH	12	V	500	2	0	50	7.3	6.8	1.3
KRPD	00	V	500	1	0	0	2.0	0.7	-1.9
KRPD	12	V	500	1	0	0	5.2	4.7	2.3
LDWR	00	V	500	29	0	0	3.9	0.9	-1.1
LDWR	12	V	500	29	0	0	4.9	-0.4	-0.3
OXTS2	00	V	500	10	0	10	17.3	-6.4	-1.3
OXTS2	12	V	500	9	0	0	4.0	0.3	0.0
OXYH2	00	V	500	3	0	0	7.4	-0.9	0.8
OXYH2	12	V	500	4	0	0	7.4	0.5	1.0
PACDG	00	V	500	1	0	0	3.8	-3.7	1.0
WAAH	00	V	500	4	0	75	9.1	-3.8	-2.3
WAAH	12	V	500	3	0	100	9.1	-8.5	-1.4
WPKD	00	V	500	6	0	0	2.4	-0.4	-0.5
WPKD	12	V	500	3	0	0	6.1	0.9	-4.1
ZCBP6	00	V	500	11	0	0	3.8	-0.6	-0.4
ZCBP6	12	V	500	6	0	0	3.3	2.2	0.6
03953	00	V	500	29	0	0	4.3	0.4	0.2
03953	12	V	500	29	0	0	3.8	1.0	0.4
04018	00	V	500	28	0	0	4.8	1.0	-0.4
04018	12	V	500	29	0	0	4.8	0.0	-0.4
04220	00	V	500	29	0	0	3.7	-0.9	-0.3
04220	12	V	500	27	0	0	4.3	-0.5	0.8
04270	00	V	500	29	0	0	4.3	0.1	0.6
04270	12	V	500	30	0	0	4.3	0.5	-0.1
04339	00	V	500	26	0	7	7.7	-2.8	0.2
04339	12	V	500	28	0	3	5.8	0.9	0.3
04360	00	V	500	29	0	0	4.7	0.2	1.4
04360	12	V	500	28	0	0	4.5	1.3	0.3
08001	00	V	500	28	0	0	6.4	2.1	0.8
08001	12	V	500	25	0	0	4.4	1.0	1.2
08508	12	V	500	14	0	0	4.6	-1.1	-0.4
08522	12	V	500	23	0	0	3.1	0.2	0.2
08594	12	V	500	27	0	100	4.9	0.4	1.5
71600	00	V	500	29	0	0	4.7	0.0	-0.3
71600	12	V	500	30	0	0	3.7	0.1	0.6
72201	00	V	500	29	0	0	2.8	-0.8	0.3
72201	12	V	500	30	0	0	2.5	-0.5	0.1
72402	00	V	500	29	0	0	3.1	0.9	-0.1
72402	12	V	500	30	0	0	4.1	0.1	-0.4
74494	00	V	500	27	0	100	4.0	-1.6	-0.5
74494	12	V	500	29	0	100	3.7	-1.1	0.6
78016	00	V	500	28	0	0	3.3	0.5	0.0
78016	12	V	500	26	0	0	3.2	0.8	0.0

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45